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American Academy of Dental Science.

The regular monthly meeting of the American Academy of Dental Science was held in the Boston Medical Library Association Rooms, March 1, 1893, at 7.30 P.M., President Brackett in the chair.

President Brackett.—The paper for the evening is by Dr. J. Adams Bishop. Subject, "Injuries and Diseases of the Mouth." Owing to the absence of Dr. Bishop the paper will be read by his brother, Dr. H. F. Bishop.

INJURIES AND DISEASES OF THE MOUTH AND THEIR TREATMENT.

BY DR. J. ADAMS BISHOP, NEW YORK.

Mr. President and Gentlemen,—According to the monthly notice of your Executive Committee, I am to read this evening a paper on the "Injuries and Diseases of the Mouth and their Treatment."

Such treatment is either surgical or non-surgical, or mechanical. Surgeons and dentists have to seek the assistance of one another to effect cures. Sometimes the dentist has to prepare the way for the surgeon's knife, and in other cases the dentist has to aid the surgeon by a mechanical support. Opportunities of this kind are constantly coming to our hands, and we should be thoroughly familiar with the methods of treatment proper in each case, or else we should turn the patient over to some one who is.

The cases I shall to-night speak of particularly have never, to my knowledge, been presented to a dental society nor put forth in a dental publication, but were so important that the surgeons in charge have reported them before the Academy of Medicine, the

New York State Medical Society, and the National Medical Society, and these reports can be found in their publications and in the "Medical and Surgical History of the Rebellion," Part First. The casts are also to be found at the Anatomical Museum at Washington.

I will present first a case of partial reconstruction of the face, found in "Buck's Reparative Surgery," 1876. The patient was Carleton Burgan, aged twenty years, a volunteer in one of the Maryland regiments. His history, previous to his admission to the New York Hospital, was furnished by Robert F. Weir, M.D., assistant Surgeon United States army, in charge of the Army General Hospital at Frederick, Maryland (where Burgan had been a patient before coming to this city).

"He was taken sick June 5, 1862, with rheumatic pains, due to exposure to wet and cold. During the next month he was under treatment at the army hospital for typhoid fever, and in the middle of August, when his general condition appeared to be improving, gangrene set in, and, beginning with a small black slough, attended with fetor, on the gum at the foot of the first right upper bicuspid tooth, rapidly extended until it had involved and destroyed the right half of the upper lip, the adjacent portion of the cheek, and the ala of the nose, and denuded the entire superior maxillary bone. By the middle of October contraction of the healing parts had taken place to such a degree that the hole in the face was diminished nearly one-half in size. On the 23d of December, Burgan was discharged from the hospital in Frederick and from the United States service to go to New York."

On December 31, 1862, when admitted into the New York Hospital (as a patient in the hands of Dr. Gurdon S. Buck, surgeon to the New York Hospital and a member of the Academy of Medicine), his general health was good and continued so. The condition of his face was as follows:

"The right eye was destroyed and sunken; the right half of the upper lip, the right ala of the nose, and the adjacent portion of the cheek, besides the entire right superior maxillary bone, were gone, leaving an extensive opening directly into the cavity of the mouth and right nasal fossa. The margin of the opening, which was everywhere cicatrized, consisted below of the border of the lower lip which was prolonged on the right side, obliquely upward and outward, and adhered to the malar bone at a point where the superior maxilla had separated from it. From this point, which corresponds with the middle of the cheek, the margin of the opening extended upward and inward in a curved direction to the side of the nose,

approaching within a finger's breadth of the inner canthus of the eye, continuing thence along the ridge of the nose to its tip and a a little to the right of the median line. The columna nasi being destroyed, the lower edge of the left ala and the rounded margin of the left half of the lip bounded the opening in this direction.

"The middle incisor of the left superior maxilla was wanting; with the exception of this and one molar, the teeth of that side were complete. The lining membrane of the cavity had everywhere a remarkably healthy aspect. The velum still retaining its bony support, performed its functions in deglutition undisturbed. The patient's speech, however, was very indistinct, and resembled that of a person with a bad cleft palate.

"In devising a plan for the restoration of this extensive destruction of parts, it was judged indispensable, as a prerequisite to any surgical operation, that an artificial substitute should be adapted to the cavity of the mouth, to supply the place of the right maxillary bone and afford a solid support to the soft parts that would be required to be transposed for the reconstruction of the mouth and the closure of the cheek and nostril.

"Dr. Thomas B. Gunning, an eminent dentist residing at No. 41 East Twenty-first Street, to whom the case was submitted, generously undertook the execution of this delicate and difficult work. The result, which he achieved after patient and persevering labor, displayed remarkable ingenuity and skill, and cannot fail to elicit universal admiration. The fixtures which he adapted were made of vulcanite, and consisted of two principal pieces. The upper piece, being first introduced, occupied the nasal fossa and filled out the right half of the nose. It was hollow, and open in front and behind for the free passage of air. The lower piece formed an artificial palate, covering the entire bony portion of the roof of the mouth, and supplying the right half of the dental arch with the teeth belonging to it. Its left margin took support from the existing teeth of that side, some of which it embraced. The surfaces of both these pieces, where they come in contact with the walls of the nasal and buccal cavities, were channelled with furrowed lines to facilitate the flow of the secretions back into the fauces. Their accurate adjustment to each other, and to the walls of the cavities which they occupied, permitted them to be worn without causing the least irritation. A third supplementary piece completed the arrangement. It capped the molar teeth of the lower jaw on the right side, and was connected with the opposite portion of the palate piece above by a spiral wire spring. The improvement of

the speech produced by these fixtures, as well as the increased facility of mastication afforded by them, were results highly gratifying to the patient and satisfactory to the surgeon. The material of which they were constructed was admirably adapted, by its light and indestructible nature, to its use. After the patient had worn them constantly for more than two weeks, to test and become habituated to them,—he himself removing and replacing them for the purpose of cleanliness with the greatest facility,—it was decided to perform the first operation on the 26th of March.

"This took place at the New York Hospital in the presence of a large number of physicians. Four operations followed, of rhinoplastic surgery, on April 23, June 18, August 8, and October 27, 1863.

"Within six days after the final operation the sutures were all removed, and the adhesion was perfect. A great improvement in appearance was thus accomplished."[1]

I was present at all of the operations at the hospital, assisted in taking all the impressions, and made all the rubber appliances and the casts exhibited here to-night. These appliances, though non-surgical, were of great assistance to the surgeon in giving back to this man the lost speech, mastication, and deglutition,—no small items when considered with his improved appearance. I visited him in Baltimore ten years after this transformation, and had the satisfaction of seeing the same plate in use that he wore when discharged from the hospital.[2]

Dr. Buck brought before a meeting of the Academy of Medicine on February 7, 1866, the following case:

"Egbert Hewett was wounded, on the 19th of September, 1864, while under Sheridan, at Winchester, Va., by a fragment of shell, which came from the left and struck his mouth. The upper and lower front teeth were carried away, the right cheek was laid open from the mouth to the angle of the jaw, and the lower jaw was fractured at the symphysis. The teeth were replaced on plates in December, 1865; auto-plastic surgery completed the operation, and the patient was discharged January 19, 1866."

This case happened to come under my personal supervision, by my appointment to the staff of St. Luke's Hospital, through the courtesy of Dr. Buck.

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[1] "Buck's Reparative Surgery," Appleton, 1876.

[2] Since reading this paper I have again had the satisfaction of seeing this man in Baltimore, and found him still using the same plate, and his face in a good, healthy condition. It proves what good blood he had, that he has outlived all the surgeons who watched these operations.—March 10, 1893.

FRACTURES AND THEIR TREATMENT.

In fractures or injuries presented to us, there are two things to be carefully and thoroughly considered: First, a correct diagnosis must be made to discover the extent and condition of the injury or fracture, in order to set the bones in their normal position, which is handy work for a skilful surgeon or an anatomist; second, to see what mechanical appliances can be adopted to hold the parts steadily in juxtaposition, so that their may be a reunion by the process of nature, which always comes to our aid whenever and wherever she can.

It is no reflection upon the most skilful and distinguished surgeons to say that they ought, in many cases, to seek the aid of the dentist and his mechanisms to supplement their services in the interest of their patients; for he (the dentist) has experience in mechanical structures, which they (the surgeons) cannot be supposed to readily furnish.

In 1852 the Nelson Goodyear discovery of the process of vulcanizing caoutchouc came to the aid of dentistry. Its value to our profession cannot be overestimated; and here we first had the opportunity to introduce perfectly interdental splints of vulcanite, which hold the parts so comfortably and firmly as to supersede all appliances of bandages, etc; not only that, but it sometimes saves the patient from additional trouble, such as abscesses and exfoliations, which often in the past complicated cases treated by the old method of bandaging.

During a long association with the late Dr. Thomas B. Gunning, who was the first to use interdental splints (even before he was called in that historic case of Secretary Seward), I assisted in all his cases, both in private and hospital practice. The late Dr. Gunning is entitled to great respect for his skill and perseverance in whatever he undertook in dentistry, but his uncompromising attitude in the presence of such eminent surgeons as Surgeon-General Barnes and the medical directors of the army and navy was uncalled for. There was neither courtesy nor dignity in his consultation with them, during the treatment of Secretary Seward, in condemning the use of bandages which they used, and treating them as if they were incompetent practitioners or quacks. It was such conduct on the part of Dr. Gunning that deprived our profession of its proper credit, for, when they made their published reports, they studiously avoided all mention of him and his appliance, and no one could blame them.

CASE I.—"By an explosion on a Spanish man-of-war, while firing a salute in our harbor, in 1860, one of the men received the full force of the explosion, and was taken to the United States Naval Hospital, Brooklyn, where Surgeons Franklin and Gihon were in charge. I have here the casts representing his injuries.[1] They consisted of a comminuted fracture of the lower jaw at the symphysis, the teeth of both jaws much shattered, with face severely burned and lacerated.

"The case had been carefully treated for over four months without producing any union, when, by the advice of Surgeon Bache, Director of the Naval Laboratory, Dr. Gunning was requested to treat it. The jaw was then contracting from loss of bone, and pieces were coming out through the chin. He applied a hard, vulcanized rubber splint, which enclosed the remaining teeth and gum of the lower jaw, its upper surface fitting well over the teeth above, except in front, where it was trimmed down to allow food to pass between the remnants of the superior incisors. The splint was fastened to the lower jaw by screws passing into a broken tooth on each side. The jaw was held up by starched muslin, moulded to a cast of the parts, in repeated folds, until a line in thickness. This reached to the zygomas, and was kept up by a band passing over the head. The splint was applied February 12, 1861. Fragments of the bone came away for some time after, but the splint was not removed during the treatment. The jaw united well by the middle of May, and the man was discharged."

You can get but a faint idea from this report of the labor over this poor man; sick, tired out, with a fracture of the lower jaw of over four months' standing, every part of the face tender to the most gentle touch. And what was the condition on getting the mouth open for correct diagnosis? Anything but inviting. It was foul and slimy with pus, fetor, etc. Surgeons of the hospital had exhausted every method at their command. When Dr. Gunning was called into the case, with me as his assistant, the process of treatment was commenced inside the mouth. It took much time to manipulate the parts of the mouth, to open it sufficiently for cleansing, and then to take the impressions. The external bandages were of no use to us, but, as we could use vulcanite, we soon saw that we could make a cap of it which would help greatly when fastened. We were ten days, trying with many devices, before we thought of using screws to hold it. When they were made

[1] New York Academy of Medicine, October, 1863, and *Dental Cosmos*, 1863.

and inserted we felt that something had been accomplished; and, as we watched it from day to day, we found they did not fail us, and we saw a most wonderful improvement going on. He was sent home with this splint in his mouth. This is the first interdental splint ever made of vulcanite, and it opened up a new treatment for the lower jaw.

The medical men of the Naval Hospital and Laboratory were the first to appreciate its benefit, and, as an outgrowth of the case, Dr. Gunning was called to Washington by Surgeon Bache of the Hospital.

Case II.—"Dr. Gunning himself received a compound fracture in his own jaw between the right canine and lateral incisor teeth, on November 4, 1862, through his horse falling under him. The bone was much displaced, and two incisor teeth loosened. He set the bone, and it was held by strong, well-stretched silk, enclosing three incisors, the right canine, and the first bicuspid. This immediately stopped the bleeding and held the bone firmly. A vulcanite splint was applied thirteen hours after the injury. It enclosed all the lower teeth, and was fastened by gold screws to the first molars. It held the fragments so well that he was able to attend patients in the afternoon, and continued so to do subsequently. The gum united by first intention, and the pain and swelling, which were very great in the external parts, diminished rapidly. On November 28 the splint was removed, and good but flexible union found. It was again fastened on, but, after seven days, was worn without the screws, and removed daily. The jaw grew strong, the teeth firm, and the splint was left off January 1, 1863, but worn at night until February 1. The jaw was used in eating, talking, etc., throughout the treatment."

The case was presented to the New York Academy of Medicine, January 7, 1863, by Dr. A. L. Sands. He refers to a conversation had with Dr. Gunning, in which the latter outlined his plans for securing a broken jaw, and says he had promised, in case of meeting with such an injury, to try it, and comments on Dr. Gunning being one of the first to receive the benefit of his own ingenuity.

In the discussion that followed the reading of the paper, Dr. Alex. N. Stephens, Professor Emeritus of Clinical Surgery in the College of Physicians and Surgeons, said,—

"I look upon this splint as far beyond anything in the way of treating fractures of the lower jaw that has ever been discovered, and I congratulate the Academy on this discovery, for I fully believe it to be of such importance that it will last forever."

The splint was shown the Medical Society of the State of New York in February, 1863.

I wish to present to you a few additional facts about this case of Dr. Gunning's.

When he came into his house, he said, "I have broken my jaw." "It can't be so," I said to him. He took hold of each side of his fracture and pulled it apart so that I could pass my finger through it.

Dr. Sands was sent for, also Dr. Hosuck, who lived very near. Dr. Hosuck cared for his face and prescribed for him rest and quiet, and said in a few days he would care for the bone. Dr. Gunning thanked him and said he would be glad to see him, but would treat his fracture himself. He then said to me, "Whom can you get to help you to make my splint, so that it can be placed on the jaw to-morrow morning?" I availed myself of the kind services of Dr. —— (by request, his name is omitted). He took the impression about eight P.M., remaining all night to help make the splint, and we were able the next morning at nine to place it in the mouth. It was a very strange coincidence that Dr. Gunning should receive such a fracture, eighteen months after the Naval Hospital case, to enable him to receive and prove his own medicine or method. It proves the great value of this treatment of a fracture, that he never lost an hour from his office. How different it would have been had it been treated under the old method of bandaging! This was the second interdental splint of vulcanite ever used.

CASE III.—"G. B., aged forty-five years. His jaw was fractured by a blow through the socket of the right second bicuspid, June 5, 1863. There was a displacement of the back fragment inward and forward. The patient could not lie down, but slept in a chair holding the jaw, as the surgeons could not keep the fragments in place. The fracture commenced inside the first bicuspid tooth, and passed backward and outward through the socket of the second, and downward also at the expense of the back fragment. As the loosened bicuspid had been extracted, instead of being kept in place, there was nothing to prevent the back fragment from sliding inward and over the front one and impinging on the inferior dental nerve. The splint was worn until September 3. The jaw was allowed its natural motions throughout the treatment."

This splint was presented to the New York Academy of Medicine in October, 1863. Dr. Gunning received the thanks of the Academy, accompanied by a request to report further when he should have completed the splint which he considered best adapted for general use.

This case (No. 3) was a very difficult one. Mr. B. lived on Washington Square, north. He received the fracture at ten P.M., while out for a stroll on the square, nearly opposite his house, by being hit with a slungshot. His physician (a member of the Academy of Medicine at the time Dr. Sands reported this interdental splint, five months before) and two other physicians were called in, and yet the only thing they did for the patient was to apply external bandages and tell him he would have to sit in his chair and keep his mouth as still as he could until nature had affected a union.

These physicians had entirely forgotten, if they had ever heard of, Dr. Sands's paper and Dr. Stephens's remarks upon it; and it was left for a lady friend of Mrs. B. to tell her of Dr. Gunning and his method, and the experience he had had with his own mouth.

This fracture being at the inferior dental nerve, every movement, however slight, would cause him great pain, and his sleep was greatly disturbed even while in a sitting posture, for the moment sleep came the hold of the muscles was relaxed, and, the jaw falling, he would be awakened instantly by the pain. Some days passed before the splint was fastened to his mouth, but this so controlled the muscles that on returning home he lay down on his bed and had his first good sleep for ten days.

This is my experience with this patient, whom I saw every day.

CASE IV.—"J. Q., twenty-five years of age, had his jaw broken by being thrown from a cart on December 29, 1863. On the same day he called in a physician, who tied the teeth together and sewed up a deep gash over the left masseter muscle. The ligature did not permanently control the fracture; the teeth became very loose and the front of the jaw was drawn back inside of the left fragment. Patient went into the Bellevue Hospital on January 9, 1864. The left lateral incisor, loosened by the accident, having been extracted, attempts were made to hold the jaw in place by passing wire around the teeth, but without success. On January 14 the patient was brought to Dr. Gunning's office. He found the jaw fractured through the socket of the left lateral incisor, slanting towards the symphysis as it descends. The gum was red and painful; there was great tenderness under the jaw and upon the ramus, which was also supposed to be fractured. On January 15 he applied a vulcanite splint without screws or any fastening. It held the fragments in place, and the patient experienced great relief. On February 13 he took off the splint temporarily; no displacement followed, but the union was very soft. After this he removed the splint and examined the parts weekly. On March 9 the wound was healed.

On April 9 the union was strong, but it was deemed advisable to wear the splint longer on account of the canine tooth which was not yet firm. The jaw articulated with the upper, and the upper and lower teeth fitted against each other well. On May 1 the splint was dispensed with."

CASE V.—"Mary Ann D., twenty-nine years of age, was found in a state of insensibility February 12, 1864, and sent to the Bellevue Hospital the next morning. She remained unconscious until the 16th. On February 17, Dr. R. B. Brownell spoke to Dr. Gunning of her broken jaw, but said nothing could be done to it at present, as her head and face were so terribly swollen. On February 21, Dr. Gunning saw the patient at the hospital, and found her lower jaw broken on the right side, commencing half an inch back of the canine tooth and passing downward at the expense of the back fragment. There had been no teeth back of the canine for some time, and, the gum being torn, the back fragment rode over the front, with its point sticking out sharp and bare for three-eighths of an inch in the direction of the symphysis. On February 22 the patient was taken to Dr. Gunning's office. The swellings on the face had lessened somewhat, but were still undiminished in the gum around the fracture. On the left side there were no teeth back of the bicuspid, and the gum was sound and healthy, but indented by the upper wisdom-tooth, which had been pressing into it since the accident, previous to which it had not done so. This condition of the parts induced him to examine the left ramus carefully, and he found great play of its upper back portion, especially inward; but the only displacement, when at rest, was upward and forward, and this to no great extent, as it was checked by the upper wisdom-tooth. He finally concluded that a fracture existed in the neck of the condyle, passing downward and backward, thus allowing the muscles to draw the bone upward and forward. The lower jaw contained only the four front teeth, the two canines, and the first left bicuspid; the gum back of these was free from roots, except that of the right wisdom-tooth, which still remained, but was decayed close down. The upper jaw had been without the eight teeth forward of the second bicuspids for some time; of the other eight, seven still remained, the right second molar only having been extracted. To set the jaw the right fragment was put in the best position that could be obtained with the fingers, assisted by a stout piece of silk passing round the left canine. A jack-screw with a collar fitting against the root of the wisdom-tooth in right fragment, and the other end bearing on the gum between the left lat-

eral incisor and canine teeth, was then screwed out until the extension was sufficient to allow the fractured bone to come into proper position. The end of the long or forward fragment was then held up, and an impression in soft wax taken of all the teeth and gum as far back as the ramus on each side. Care was taken to put the bone in place at the neck of the condyle, while the bite was obtained. On February 28 he applied the splint. On March 2 the patient brought a request from the surgeon in charge of her case at the hospital that Dr. Gunning would screw the splint fast to the teeth. The gum had grown over the point of the bone; it was now, therefore, only a simple fracture. He screwed the splint fast. On March 14 the patient was in good spirits and quite comfortable. She wanted to leave the hospital and go to work. She made no complaint as to the teeth. On March 26, at Dr. Gunning's request, the patient was discharged from the hospital, but still wearing her splint. On April 8 the splint was removed and a good union found. The splint was worn just forty days, but the patient had a good constitution, and the bone united rapidly. On June 7, 1865, the patient sent word to Dr. Gunning that the jaw was all right."

Cases IV. and V., as here reported, were treated in Bellevue Hospital on December 29, 1863, and February 12, 1864, respectively. I have no comments to make on these, as they are fully reported.

Case VI.—Wm. H. Seward, President Lincoln's Secretary of State, sustained a fracture of the lower jaw, as we all know. The injury was caused by falling from a carriage April 4, 1865. Unsuccessful attempts had been made to hold the jaw in place by bandages, and also with ligatures on the teeth, by the surgeons first called to the case. On the 14th, the date of that awful tragedy in Washington, when Lincoln was killed, the assassin Payne forced himself past Mr. Seward's son, nearly killing him at the door defending his father, and succeeded in reaching the bedside of the sick Secretary, and inflicted a severe cut about the jaw and throat, which was intended to end his life then and there.

I can well recall the circumstances of this sad day to our nation, and the gloom resting over the city of Washington when I arrived there, having been requested to accompany and assist Dr. Gunning in his efforts to bind up Seward's broken jaw.

Lincoln's dead body lay in state, and all our distinguished men were watching the course of events with great anxiety.

Dr. Gunning had been called before the tragedy took place, but did not get there until after it happened. We visited and

treated Mr. Seward in the same room where Mr. Blaine so recently ended his earthly days, making it our dental laboratory.

I will read from Dr. Gunning's report of the case. "The cut inflicted reached from under the right zygoma to the left of the trachea. Steno's duct was severed, and the right fracture laid open externally, the bone being also much exposed in the mouth from the original injury. No arteries had been ligatured. The wound was neatly sewed up, and was healing by first intention, except immediately under the fracture. The swelling and stiffness made the examination difficult, but the ramus proved to be uninjured. There was, however, a second fracture, but on the other side of the mouth, the jaw being fractured on both sides between the bicuspids. The lower jaw contained all the ten forward teeth. The right wisdom-tooth and root of the left were all that remained back of the bicuspids. The part in front, containing eight teeth, was drawn down out of place, while the right back fragment, with the wisdom-tooth and second bicuspid, was drawn up, showing its fractured end white and bare. Pus discharged profusely from both fractures. The gum was pale and flaccid, in keeping with the general condition of the patient. The upper jaw was entirely without teeth. We deemed it important to set the exposed bone in place as early as possible, and also to give the patient time to recuperate, as he had already been subjected during the morning, not only to a relation of the President's death, but to much that was said and written upon the subject. In the afternoon, while explaining the treatment proper for the case to Dr. Whelan, Dr. Gunning stated his unwillingness to commence, except with the understanding that he should control it entirely.

"*April* 29.—He set the jaw, and held it in place by wire and silk ligatures, took a wax impression of the teeth and gum, and obtained the bite directly from the teeth, etc. Although the front of the jaw containing the eight forward teeth was greatly displaced (before the setting), the silk and wire ligatures held well until May 2, when they were removed and the splint applied. It was of hard, vulcanized rubber, covered the roof of the mouth and adjacent gum, enclosed all the lower teeth, and went down over the gum on the outside somewhat. This splint held the jaw firm for sixty-eight days, when it was removed. There was good union on the left side, but the right fracture was still ununited. For this, however, Dr. Gunning was prepared, as the bone had been exposed so much during the twenty-four days which had elapsed before he set it; and the saliva from the right parotid gland had discharged

through the fracture. This was one of the worst features of the case."

Let me only add a word to this.

This case to-day in my hands could be treated without this external arrangement. I should use the simple splint of black rubber, like one I have placed before you, for I feel sure that the artificial denture would act as kindly as the natural teeth.

I have searched all the medical and dental works in vain for any description, either modern or ancient, of any invention prior to these dates, of splints, made of vulcanite, as applied to fractured jaws. It is my privilege to put this on record, as having been personally in charge of the above cases, under Dr. Gunning; and I know what I say when I speak of priority of invention of interdental splints of vulcanite.

In a communication of Dr. T. B. Gunning to the late Professor Agnew, of Philadelphia, wherein he claimed the great superiority of his interdental splints over all other appliances, as doing away with all external bandages, except in the case of an edentulous condition, he remarked that no case without teeth was on record prior to the one reported in May, 1879, in Johnston's "Dental Miscellany," vol. vii., page 63. The case referred to was in my hands for treatment, and, as it was one with many difficulties, treated successfully with poor facilities at command, I will venture to repeat part of the report to you to-night.

"I was called in consultation by Dr. Phinny, of Norwich, Conn., in the case of Asa Bailey, aged seventy years. While recovering from a severe attack of pneumonia he had tried to go down-stairs, but, owing to his feeble condition, fell, and received a compound fracture of the lower jaw, the bone protruding through the gum. His last tooth, a canine on the right side, was knocked out and lost. The fracture was ten days old, with considerable displacement. Dr. Phinny had reduced it with much care and skill, but could not, with bandages, keep the parts in position. There being an entire absence of teeth in the mouth, my first difficulty was to secure the fragments in position. I had never met with such a case. I was without cups or proper conveniences for taking the impressions, and in the country where no dental office was near. Having, however, a little plaster, with a pair of shears and plyers I made cups for upper and lower jaw out of a tin milk-pan, and succeeded in getting good impressions, from which I made the splint at my office in New York. I did not see the patient again till six days after; but with a little trouble the fractured jaw was placed in the splint. The value of

this splint could not be better demonstrated than by the confidence which the patient expressed when it was adjusted. He at once felt that his jaw was secured from the displacing action of the muscles. He could breathe better and swallow with greater ease. I have found this so with all patients under this mode of treatment. I saw the patient again in three weeks, and, on removing the splint, found the fracture well united for so short a time. The patient was then feeling so encouraged that he wished to improve his time by going to work, and before my next visit, three weeks after, he was out following his plough, and doing heavy work with little inconvenience.

"I removed the splint in just six weeks from the day it was first applied. The union was then strong; and it was well ossified in November."

M. Malgaigne, in 1847, says that no case of fractured lower jaw destitute of teeth seems to have been presented for treatment. Such a case seems never to have presented itself to Dr. Gunning in more than forty years' experience.

Books, in great number, have been written on fractures and their treatment, by many of the most learned surgeons of the world,—by Drs. J. F. Malgaigne, Lonsdale, Boyer, Cloquet, Stimson, and William Gibson, who, in 1827, occupied the chair of surgery in the University of Pennsylvania.

The late Frank H. Hamilton, M.D., of New York, in his "Treatise on Fractures and Dislocations," published in Philadelphia in 1863, devotes twenty-two pages to the fracture of the lower jaw; and yet, in all these writings, no mention whatever is made of the interdental splint, until in the 1884 edition he devotes thirty pages to it, and refers particularly to Kingsley's.

Bean, a surgeon in the Confederate service, reported through the *Richmond Medical Journal* that he had over forty cases in the army hospitals. It seems a large number, when we consider how rare the cases are.

Dexter's "Centennial Historical Account of American Dentistry," published in 1876, failed to make any mention of the interdental splints. And yet Dr. Gunning made an exhibit in the Centennial Exposition of the interdental splints for the treatment of fractures of the jaws, including that used in Secretary Seward's case. And in the "Reports and Awards," Group XXIV., edited by Francis A. Walker, chief of the Bureau of Awards, page 25, he says, "He (Dr. Gunning) claims, and I believe justly, that it was the first splint ever used without an appliance outside the mouth." In

this same publication fifteen pages are devoted to artificial legs, six pages to trusses, six pages to surgical instruments, three pages to splints, and nineteen pages to dentistry, of which six pages are devoted exclusively to Dr. Gunning and his hard-rubber appliances for fractured jaws and the cleft palate; of such importance did this matter seem to these judges, all of whom were either physicians or surgeons.

One other matter I wish to mention is the use of jaw-cups in which to take impressions, from which to make the interdental splints. They are of particular value to country practitioners, and are very easy to become familiar with. Dr. Gunning's idea was to use gutta-percha in the same cup, after getting the cast, and thus make a splint of it; but I prefer to use vulcanite splints, perforated so that, when they are in place, the tongue and muscles of the cheek are constantly forcing fluids through, and, with a brush, they can be kept very clean.

The important results that surgery and dentistry can accomplish, when worked together in the interest of an unfortunate human being, are well illustrated by the case of Josiah Dutcher, who was under the treatment of Dr. H. B. Sands in 1873, and whose case was reported that year by the New York County Medical Society. I have here the casts made in the Dutcher case and his photograph, which makes him a presentable and even good-looking man after he had been reduced fearfully by the surgeon's knife and the parts restored artificially by the dentist. This was a case of naso-pharyngeal polypi, wherein the surgeon successfully encountered many difficulties by an operation through the mouth, and made extensive removal of parts attended by serious risk of hemorrhage into the glottis.

The time this evening is entirely too short for me to refer in this paper to cases of cleft palates. But I wish to speak of a case of cancerous tumor, as it involved so much where the dentist supplemented the surgeon, supplying lost parts by the use of vulcanite. Of the many cases I have had to treat, I recall one where the gratitude of the patient was expressed to me by letter, within a day or two after the mechanism was placed in his mouth. The late Dr. H. B. Sands had removed a cancerous tumor for the Rev. J. E. Rockwell, of Staten Island, the removal involving one-half of the upper jaw with the hard and soft palate from the median line on the right side. This left him without the power of articulation. The dentures had to be most carefully fitted, and balanced with spiral-springs, he having no natural teeth left; and the upper

denture had to do a twofold work, having an obturator attached to it. The patient was so well satisfied that he wrote me he considered he had a new lease of life. He said his voice was good; in fact, he had just performed a marriage service.

These seven cases of fracture which I have reported, and of which I have shown you the splints, have all been discharged, as cured, in less than four months, with little interruption from every-day business.

I do not suppose you will have in your office to-morrow a simple, compound, double, or edentulous fracture; they are very rare, as is well shown by the report of one of our largest hospitals for the year ending September 30, 1891. This report shows a total number of two thousand six hundred and thirty-four cases, both medical and surgical; of these, seven were treated for fracture of the lower maxilla and three of the superior maxilla.

In a conversation had within ten days with a surgeon of another large hospital, he stated that he did not believe he had ever had a case of fracture of the lower jaw in his private practice, and had only treated two in hospital practice, in both of which he had used bandages. This will suffice to show the comparative rarity of these cases, and yet we ought certainly to be well prepared to adopt the latest and most approved treatment, when such cases are presented to us.

At times our profession has tried to make a most worthy showing of progress. But, as I said before, the "History of Dental and Oral Science," coming down to 1876, failed to notice this important treatment in dental surgery, and yet it had been in use thirteen years.

The text-books for our dental colleges are faulty, and hence the teaching must be. The great hospitals of this city are treating in the old way with external appliances, as I have myself seen, with regret.

In the Congress which met in London in 1881 there was nothing which helped the dental profession very much, or that would attract the older surgeons to our specialty; and the three other triennial Congresses, which have since met, were not, as far as I know, of any account in improving the method of treating fractures of the maxilla bones, if judged by their published proceedings, which I have looked over carefully.

We are now fast approaching the World's Columbian Dental Congress, where the dental profession will be together in a representative body. At this Congress it is expected that papers and

reports of great interest and value will be presented in such numbers and volume as to make books for future dental history.

It is not for me to say that the subject-matter of this paper is worthy a place in, and the consideration of, the Columbian Congress. But I do say that these inventions and devices are equal to any exigencies in the treatment of fractures which can come before us; and some of them have the additional value of being the original inventions used several years before any other splints of vulcanite came into notice. Therefore I suggest that our dental publications shall place them on record. Because they are important in history, as well as practical for present use, they deserve to be on exhibition, and ought not to be crowded out by less important splints which some members of our profession may desire to show with their alleged improvements.

Whoever, in this advanced stage of dental surgery, has to resort to external bandages is not doing for the patient that which tends to his most speedy recovery. But it is he who can so harness the great net-work of muscles which nature has so magnificently formed around the bone as to make them serve in the treatment, which they can do because they pull and draw so kindly and gently over the wounded parts as, by their natural action, to bring the bone into closer unity, thus keeping the bones in place until nature completes the work; he that can do this, I say, is doing a twofold duty by his patient. For he not only repairs the fracture, but he secures a rapid recuperation of his patient by making it convenient to take substantial and nourishing food for the body which is called upon to build up the new bone for the cure.

DISCUSSION.

President Brackett.—Gentlemen, you have heard this most interesting and valuable paper. The subject is before you for discussion, and I will call on Dr. Clapp to make the opening remarks.

Dr. Clapp.—It is a matter of very great regret that our numbers are so small, because the historical facts in this paper are not only very interesting but very valuable.

I wish that a description of the manner of holding the parts in place while the impression is being taken had been more fully described, for it seems to me that this must be the most difficult part of the whole operation of making these interdental splints.

The thoughts that the paper brings out show how much one class of specialists depends on another, and how one may assist the other, and how necessary the combined ingenuity and skill of all

are to the best treatment of the injuries that happen to humanity. These injuries are of such importance to those who receive them that the very best skill is none too good for their treatment.

The amount of pain that may be saved by skilful as compared with that which must be endured by unskilful treatment is a matter of very great moment, and to us it is an occasion of pride that the great advance in the treatment of fractures of the jaw is due to the ingenuity of a dentist, and I hope that a complete and adequate record of this subject will be brought out at the Columbian Congress.

As regards the matter of ingenuity, particularly in original appliances, I am reminded of what was said at the annual meeting of the Harvard Odontological Society last Saturday night by Dr. Hunt. It was in this vein: that dentists have done a great deal in the matter of original research, and that the dental schools of this country are noted for the extent and value of what has been brought forward from an original stand-point. Whereas the medical schools follow largely the lead of the foreign schools, particularly those of the German and French. And he gave it as his opinion that the dental specialty of medicine, as he called it, was destined to be a leader rather than a follower in professional education, and that the field for young men with superior education and superior natural abilities was very great in dentistry. Just here let us think of the preparation that the dentist should have; we cannot say too often that the candidates for the dental profession should be thoroughly examined; that men of ordinary ability have no place at the present time in this profession; that the requirements are so exacting and so great that only those of superior natural ability can hope to take a place and to do the work that people with advanced ideas will require.

Dr. H. F. Bishop.—The suggestion that Dr. Clapp made is a good one, and I wish that my brother had described particularly the processes he uses for taking impressions. He is very expert in that work, and wherever he can he uses plaster, but there are cases where I am not sure that it can be used, and I am sorry that he has not described his methods. In the case of a fracture of the lower jaw, where there are teeth in both jaws, it is sometimes best to take an impression of one-half of the lower jaw at a time, and then accurately antagonize the two pieces with the model of the upper jaw.

President Brackett.—If Dr. Stevens will kindly take the chair for a few minutes I will say something on this subject.

Dr. Brackett.—It was my rare privilege to make Dr. Gunning's acquaintance in the year of my graduation from the Dental School, and to be an humble assistant of his in the practical treatment of a case of broken jaw. In the summer of 1873, Dr. Gunning was spending some weeks at Newport visiting some of his patients, and shortly after his arrival a girl of a dozen years of age was run over by a fashionable turn-out and sustained a fracture of the lower jaw. It began in the region of the right lateral incisor and extended downward at the expense of the posterior fragment.

A practical thing in connection with this case was that it had been seen by a physician of large experience, and the patient and her family had been told by him that no fracture was present.

This fact came to my mind as Dr. Bishop remarked that fractures are easy of diagnosis. It seems to me that they are not difficult if made by the dentist, but I question if the average general practitioner may always be depended on to make a ready and easy diagnosis in these cases. Dr. Gunning took the impression, but was without laboratory conveniences, and it was my privilege to be of some assistance to him and to Dr. Bishop, the preparer of this paper, who accompanied him, and who showed me in my office how to make the splint. After the return of these gentlemen to New York I was left in charge of the case. I have clearly in mind the procedures which were followed, and they would be practical in a large percentage of cases which we would be likely to meet. Dr. Gunning made no attempt whatever to reduce the fracture or put the two fragments of bone in relation to each other. That was before the days of modelling composition, and plaster was little used for impressions if there were teeth in the mouth. With ordinary beeswax in one of these cups was taken an impression, from which a plaster cast was made, which showed exactly the deranged condition of things. A study was made of the line which the fracture had taken, and with a saw the plaster cast of the lower arch was divided in about the direction that the fracture had separated it. A wax cast was also taken of the upper teeth.

All of the teeth were present in the mouth,—some temporary, some permanent, as you would expect to find in a patient of this age. With the upper arch as a guide, the lower teeth were brought to the right position with remarkable accuracy, just as we put together the models of a regulating case. Upon this correct model a vulcanite splint was made, proper antagonism being secured by imprinting the plaster model upon the wax.

Two-tailed ligatures were then passed about the necks of each

lower temporary second molar, and the splint was applied, the fragments of the jaw coming readily into their right position. The ligatures, previously tied about the teeth, were brought out through holes drilled for them in the sides of the splint, and they were tied securely on top in a little groove so made that the ligatures might not be worn through in chewing. Almost immediately after the splint was put in place the pain was relieved, and, after a very short interval, the patient was doing a good amount of mastication.

The after-treatment consisted simply in keeping the parts as clean as possible with injections through holes made in the splint for that purpose.

Within a reasonable time a gratifying recovery took place.

From that time, for a period of fifteen or sixteen years, I think every broken jaw in and around Newport was in my hands for treatment. Among those which now come to my mind are a soldier in the detachment garrisoned at Fort Adams, who was run over by horses and a field-carriage; a captain of a whaling-vessel, who was thrown violently against the rail of his vessel during a storm; a young man who was struck by a boom on a yacht; another young man engaged in coupling cars, who received a very bad fracture.

Each of these cases had its own complication, requiring time, and in some instances the surgeon's aid, before they were overcome; but ultimately all except the soldier made good recoveries. The injury to his jaw was in the left angle and ramus, and permitted the rest of the jaw to fall backward and turn to the left. Extension relieved his suffering, and one of the problems was how to keep this extension continuous. It came to my mind to use a base-ball catcher's wire mask as a point of attachment for stout ligatures which had first been tied about the necks of strongly supported left lower molars. No interdental splint was used in his case, but I think an applicable form would have been the double one, enveloping the upper and lower teeth and screwed fast.

The poor man, for a long time previous to the accident, had been a victim to grave pulmonary and other disease; he had little vitality or recuperative power, and his death occurred some weeks after receiving the injuries.

The procedures followed in the first case that I described should be a sufficient guide to any dentist of ordinary ingenuity in managing an average case. That power of invention which is an essential endowment of every successful dentist will enable him to so modify his procedures as to be prepared for almost any case of the

sort that may arise. Physicians and surgeons are ready to recognize the dentist's superior advantages and resources in the management of broken jaws, and to give him the full share of credit that he deserves.

Dr. Cooke.—Before we pass the subject I move that a vote of thanks be extended to Dr. J. Adams Bishop for his very valuable paper, and also to Dr. H. F. Bishop for his kindness in presenting the same, together with the interesting specimens, to the Academy.

A unanimous vote was passed.

President Brackett.—If the members have nothing more to say on this subject we will pass to "Presentation of Specimens and Incidents of Office Practice."

Dr. Clapp.—I want to speak of one incident of practice. Within a short time I have had two cases where the teeth have been cut away in order to fill the approximal surfaces, and now the teeth have come together at the necks, decay has reappeared around nearly all the fillings, and the amount of labor that is necessary on my part, and the patience and pain necessary on the part of these patients to get their mouths in a comfortable condition, is almost appalling. These cases show what seems to me a criminal practice of cutting away teeth to facilitate their filling.

In one of these mouths there is a peculiar condition. It was presented to me the day before yesterday. The four sixth-year molars were extracted many years ago, I should say before the eruption of the twelfth-year molars, as the second molars had taken the place of the first. Between the left superior second bicuspid and the adjacent molar is a swelling, and an abscess is threatened. I cannot find that any of the teeth on that side are dead, neither is there any apparent disease of the alveolus, and still there is a swelling like that caused by an abscessed tooth. I should like to know if any of you can tell me what causes it. It has occurred to me that possibly when this sixth-year molar was extracted, a sliver, the end of one of the roots, might have been left in, and that may be the cause of this lesion; that is the only explanation I can think of.

President Brackett.—I have had a parallel case that proved to be due to just what Dr. Clapp has suggested may be the cause in the case presented to him.

In the extraction at an early age of a right upper first molar a small fragment of a buccal root had been left. The contiguous teeth moved so as to be nearly in contact, and many years after the operation on the first molar the root fragment made a disturbance simulating an abscess of the second molar.

Dr. Clapp.—I have never had a case of this kind. I have had those of abscess arising from disease of the alveolus where there were no dead teeth, but in this the gum and alveolus is apparently healthy all about these teeth.

Dr. Stevens.—I had a case the other day that was very gratifying to me which I would like to tell you about. A boy, about fifteen years of age, who had never had any dental operation performed and who was very timid, came to the office, and was taken sick and had to go home after having almost nothing done. He came again, and I managed to cleanse his teeth, but it was a difficult task, as he was sick both in his head and stomach. He came again by appointment to have some filling done, and again became ill, and went home and had to lie in bed all that afternoon. It was simply a case of nerves, and I told the mother that one hour before he visited the office she should give him a five-grain phenacetin powder. She did so, and when he came I gave him another five-grain powder. The result was both surprising and gratifying, as the boy sat in the chair for over two hours without making any complaint or feeling any nervousness, and I succeeded in filling five cavities without any difficulty.

THE regular monthly meeting of the American Academy of Dental Science was held in the Boston Medical Library Association rooms on April 5, 1893, at 7.30 P.M., President Brackett in the chair.

DISCUSSION.

President Brackett.—Our first subject for discussion is, "To what extent and under what conditions is the collar-crown a cause of pericemental inflammation?"

Dr. Allen.—The collar-crown, when properly fitted, is, in my opinion, rarely, if ever, a cause of pericemental inflammation. When inflammation is present, it is usually due to one of three causes. And these are a lack of coaptation between the collar and the root, the presence of particles of cement or fragments of tooth under the gum after the crown is set, and a rough or unfinished edge in the collar.

There is probably no operation in dentistry which, if skilfully performed, yields more satisfaction than the setting of a collar-crown, nor one which, if performed in an unskilful or slovenly manner, is more thoroughly unsatisfactory.

Dr. Fillebrown.—In my opinion, collar-crowns are not likely to produce pericemental inflammation if properly adjusted. The troubles which arise are from mal-adjustment; the crown being too large or the root not properly dressed down, or the band going up too far under the gum at some one point. I have set a great many of them, and expect to set many more. This crown, as a rule, has been entirely satisfactory and as little liable to produce inflammation as any kind of crown that has ever been used.

Dr. Gillet.—When I read the announcement of our subject on the card it seemed to me that there was not much to be said, except that, if the collar was properly fitted and well set, there would be trouble only in very exceptional cases.

In the course of conversation with a student the other day, he made a statement that helps explain why, in some instances, the collar-crown is a source of inflammation. Before coming to the dental school he had studied with a preceptor. During our conversation he asked if I approved of gold caps. I told him I certainly did approve of the cap in its proper place. He said he had no faith in a gold cap set as he had been taught to set it. On questioning him, I found that, according to his method, the roots were not trimmed at all; the cap was selected large enough to go easily into

place; slits were cut in the edge, and when the cap was set an attempt was made to burnish it so as to fit at the edge. I suggested to him that the fault was with the operator rather than with the method of crowning.

Dr. Stevens.—I agree with others who have spoken that pericemental inflammation from collar-crowns is due almost altogether to ill-fitting bands. Many of those used are bands with level edges, there being no attempt at fitting them over the alveolar ridge; and they are struck on the top and forced into place. I have several times, when in the dental depots, seen models for which gold crowns were being selected by the dental clerks. The roots in the models had not been trimmed, and the object seemed to be to select crowns large enough to go over the roots, and then get the crowns into place as best they could. I presume the majority of the gold crowns that are put on are put on in that way.

President Brackett.—If there is nothing further to be said, we will proceed to the discussion of the second topic, which is, "The relative advantages of local and general treatment for obtunding sensitive dentine. Should arsenic ever be used for this purpose?"

This is certainly a practical matter in which no one of us, so far as I have knowledge, has attained the results he would like to attain, and in which general testimony and suggestion should be very profitable.

If we could control, modify, and annihilate the sensitiveness of dentine, we should rob our operations of a large part of their terrors; but in this field there is much yet to be accomplished. I hope the testimony of the evening will help on such a worthy, practical cause. I think we might do worse than to ask each gentleman in turn what he does in practice in the treatment of sensitive dentine. Shall we hear from you, Dr. Allen?

Dr. Allen.—I have no specific for this. I once thought I had, when the steam arrangement came upon the field. I found it to be useful, but somewhat disappointing in cases where I was very anxious to have things go off successfully. The pain that it caused has been the chief objection to its use. I now mainly depend upon subduing the nervous apprehension of my patient by careful preliminary treatment. This consists in being as calm and as reassuring as possible myself in order to relieve that dread which accompanies dental operations. I have also great faith in sharp instruments. When these means fail, and it is difficult to excavate, I simply go very slowly in burring out a cavity, using a sharp instrument. If it is so painful that my patient is inclined to stop the

operation, I try to be still more gentle, and I say that as soon as it hurts it will be the signal for me to stop. That, however, is hardly apropos to the subject.

For an obtundent in severe cases I have used within three or four months the chloride of ethyl, which I consider is very valuable. In many cases it has been a specific. As for general, systemic treatment, I apply none, because I do not feel that it is within my province to prescribe drugs of doubtful action to subdue a condition which is going to exist three days later. I simply use means which the operation demands at the time.

Dr. Williams.—I don't know that it is worth while to repeat what I have already written in regard to preparatory treatment for endangered pulps and for sensitive dentine. Although I believe there are cases where no harm or after-suffering results from the excavation of a tooth in which the dentine is sensitive, yet there are cases where hard fillings are prematurely introduced which result in neuralgia or even abscesses. For such cases this preparatory treatment which I have referred to is the most satisfactory of any method of which I have knowledge. I shall not take your time to explain it here, as anybody who cares to look it up can find it in the INTERNATIONAL DENTAL JOURNAL some time within the last two or three years.

Dr. Preston.—I have never used many of these fancy things that are now advocated. If I come across a tooth that is very sensitive, I use chloride of zinc. It will generally reduce the sensibility, and so will phosphoric acid. But when the pulp is exposed I believe the only way is to destroy it, and I generally do it with arsenic. I used to put it in twice, but now I only put it in once, although in some cases repeated applications are necessary. Some operators used to cap the exposed pulp, but such pulps never amount to anything, no matter what they are capped with.

I brought this card to show you some of the pulps that I have taken out. Those light ones were taken out with an instrument when they were alive by introducing a piece of small barbed wire, giving it a little twist, and withdrawing it. The others were destroyed by putting in arsenic. This playing with the bare nerve does not answer. They had a system called the Huelian system a few years ago; I suppose you have all heard of it. Just above the edge of the gum you drill through and stab the pulp, which lets out the arterial blood and destroys the sensibility of the tooth; but it becomes a dead tooth. I never believed much in setting crowns on dead teeth.

A gentleman met me one morning at my door and said, "I want to ask you one thing, Did you ever extract a tooth and fill it and put it back again?" I replied, "Yes, I did that more than twenty years ago." He said that Dr. —— said he was the first one that ever did it.

I was looking up two or three of my cases to get at the dates, and the first one I found recorded was a Mr. Dix, dated August 29, 1840. Another one was a Mr. Russell, and the date was October 21, 1840. I met the latter gentleman about a year and a half after the operation; he stopped me and said, "If anybody wants to know about that tooth that you put back, tell them it is a first-rate one." Another case was that of a lady by the name of Harrington.

Dr. Grant.—I have no special lines to follow in obtunding sensitive dentine except to use very sharp excavators. In the way of drugs, the one thing that I have come to rely upon more than anything else is carbolic acid crystals. When there is a very sensitive tooth, I apply the rubber dam, take a carbolic acid crystal on an instrument, and let the acid drop into the cavity. I have found more people satisfied with that than with anything else that I have ever tried. It is not always successful, but, as a general thing, patients say that it does obtund the sensibility. In this way I have excavated teeth when I hadn't the least faith that I could control the sensitiveness, having made the application more to ease the mind of the patient than anything else. I believe in sharp excavators above everything else, and the system by which I have been able to get excavators sharper than by any other, is the McLean system.

After McLean discontinued making disks I thought I would try the black rubber corundum disks that I had been using for separating. I tried sharpening an excavator with one of these, and was surprised to find the keen edge that it gave. You can get an edge that is perfectly true, and with great rapidity. On an oilstone it is about impossible to secure a true edge, but with this disk you can make it exactly as you want it.

Dr. Andrews.—I have tried almost everything which has ever been suggested. Our patients demand something. I have used with some degree of success a mixture of chloroform, menthol, and cocaine. I do not remember now the proportions, but I think Dr. Eames has spoken before the society of this same preparation. But the best obtunder is a sharp instrument, and I wish here to enter a word of praise for the mechanically perfect burrs of the S. S. White Dental Manufacturing Company. I have used the Smalls

instrument with some degree of success, but there were so many cases where it did not work satisfactorily that I gave it up. Hypnotism I have never tried. The method advocated by Dr. Williams has a good deal of merit. I thoroughly believe in preparatory treatment.

Some years ago Dr. Chandler spoke of finding the bicarbonate of soda tablets, such as are put up by Wyeth, of Philadelphia, an excellent thing to use in very sensitive cases. One or two of the tablets should be given at night for a few days before an appointment. I have tried this method in several cases and believe it to be an excellent thing.

Dr. Cutter.—My plan is to get the cavity as dry as possible, and to use sharp instruments. I use the McLean process for sharpening.

Dr. Payne.—I use a warm saturated solution of cocaine in alcohol with very good success, and in the very sensitive cavities that I cannot obtund with that I use a preparatory filling of oxychloride of zinc. This filling is allowed to remain three or four months unless the pulp would be thereby endangered.

Dr. Gillett.—I have tried almost everything that I could hear of or could find. Until lately I have relied principally on Dr. Waitt's obtundent. I don't know whether he has any special claim to it, but it is put up and is for sale under his name. Its chief ingredient I understand to be caustic potash, and the result is obtained by the process of desiccation. It is sometimes very painful. Some patients like to have me use the steady current of slightly-warmed air, which dries the cavity very thoroughly and makes it less sensitive, sometimes completely removing sensation.

Dr. Stevens.—I find nothing better than dryness and a sharp instrument. The cavity should be allowed plenty of time to dry. In case a tooth is extra sensitive it is a good plan to apply the rubber dam to obtain dryness and leave the tooth for a while, doing work upon a less sensitive one. When the sensitive tooth is returned to, there will be much less pain and perhaps none at all. There is a great deal in handling the patient. I suppose Dr. Fillebrown would call it "hypnotism." We have many patients who nerve themselves up to the operation to such an extent that they will jump if we do not hurt them at all. I try to get such patients to let go of themselves. I don't know of any better way of expressing it. I have had patients who, after learning how to relax themselves, were able to have their teeth worked on with comfort and with no fear or dread of the operation.

Dr. Clements.—I rely mainly on dryness and sharp instruments, but in addition I use a remedy which is called "Robinson's Remedy." It contains carbolate of potash and possibly some glycerin. When applied warm I rarely find any objection to it, and it certainly will obtund all sensitiveness. But I think with sharp instruments and skilful handling nearly everything that is necessary can be done without the use of an obtundent, except in cases of teeth which are hypersensitive or where there is a great deal of trepidation. Of course no gentleman here would ever think of using a very large ligature of twine and tying it tightly around the teeth, thereby causing a great deal of pain and making the tooth extremely sensitive.

Dr. Smith.—I invariably use the rubber dam, and consequently all cavities that I excavate, or a large percentage of them, are dry. And yet dryness does not fully remove sensitiveness. I have used many different obtundents; the one which I have used considerably of late is a warm solution of cocaine and alcohol. I have also been using an obtundent advertised by B. L. Knapp & Co., which was first called to my attention by Dr. Eddy. He had used it with considerable success; it seems to accomplish more than the solution of cocaine and alcohol. To-day I treated a cavity on the buccal surface of an inferior wisdom-tooth; half of the cavity going down under the margin of the gum. The clamp was applied with the rubber dam and the tooth was made perfectly dry.

I would say right here that I always test a cavity to see whether it is sensitive or not; there are many cavities not sensitive without the use of obtundents. In the case that I speak of the cavity was thoroughly dried by alcohol, then dried again by means of warm air from a chip-blower. I then took a sharp instrument and excavated carefully, with the result of producing excruciating pain. I made an application of the Knapp obtundent,—I don't know whether that is the name of it, but that is the way I have it on my book,—and I waited twelve minutes by my watch. At the end of that time I was able to excavate without pain. And here let me say that we often do not wait long enough before commencing an operation. If you have several cavities under the rubber dam at one time you can work on the one which is the least sensitive first; but if you have only one cavity you must wait. I suppose my professional brother here would say that I hypnotize the patient. I tell them that this remedy is always sure, and say to them, "Now I am going to wait twelve minutes, and at the end of that time I shall commence to excavate and you will not feel it at all." And

usually they do not. Whether it is because they believe what I tell them or because of the virtue of the obtundent, I cannot say; I think it is the obtundent. In some cases this obtundent has not worked perfectly, but it always obtunds in a degree; and possibly in the less satisfactory cases, if I had made a second application and waited, the result would have been very different.

Dr. Fillebrown.—I have found dryness an excellent thing, and of the drugs I have found cocaine the most successful. But the most desirable and successful of all is the application of oxyphosphate of zinc. By allowing this to remain for a time we get an improvement in the general condition of the tooth by the deposition of lime salts, and it is better able to stand the shock of excavating.

I know you are all prepared to hear me speak of the use of hypnotic suggestion in this connection. I shall not disappoint you. It has certainly been the most powerful and generally successful and satisfactory of any means that I have ever used, and it has stayed by me longer than anything I have ever tried. You know we often take up some new thing and use it in a number of cases, and it fails so often that we soon get discouraged and try something else, and so keep changing. But for a whole year this has continued giving great satisfaction and comfort to both my patients and myself, and I think more of it now and have better results with it to-day than ever before. I will say just this to Dr. Stevens, that if instead of asking his patients (to use his own phraseology) "to let themselves down," he will try active suggestion, making it positive, and saying, "Now this does not hurt you," "Your muscles are relaxing," "Your tooth is becoming anæsthetized," "You are resting," making it obligatory on the patients to receive suggestions, a great deal more can be accomplished. I am speaking now not in reference to a patient who is hypnotized, but one that is not. I had a boy in my chair this afternoon, twelve or fifteen years old, whose teeth have always been sensitive. I said to him, "Let me hypnotize you;" but he said, "Oh, no, no!" so I commenced talking to him in the manner which I have described, and the little fellow settled right down and bore the operation,—not without some pain, but with comparative comfort. The only difference between the patient who is hypnotized and the one that is not is this: if a person is hypnotized he will listen more readily to the suggestions and you will be able to make them more effective. In the opening remarks of Dr. Eames, he says, "Sensitiveness of the teeth depends upon a condition of the nerve-centres, and these centres are what we want to control. Now, it has been established over and over again by

myriads of circumstances that the nerve-centres can be affected by audible suggestion so that they will fail to respond to sensations produced by a shock to the teeth or any other part. This is a physiological condition, and we may as well accept it as a fact and use it. Those of you who have not considered this before, I ask to try the active suggestion; you are not dealing with an uncanny subject; you will find it produces a wonderful effect on your patients and will prove a most effective obtundent for sensitive dentine.

We all know that fear is our greatest enemy, and if we can remove fear from our patients we can get along very well. I had a patient to-day who came four hundred miles simply because she thought I could relieve her of the terrible dread she had of dental operations, and make it possible for her to have some necessary work done. It seems that when she was a young woman a dentist thrust an instrument into an exposed pulp and sought to remove it by immediate operation. In describing her sensations, she said, "For several moments I thought I was dead." Since that time she has been utterly unable to sit down in a dentist's chair. Seeing that she was willing to be hypnotized, I tried it last Friday for the first time and with entire success. She has been to my office four times since then, and sat entirely quiet for a good many hours and had no trouble at all. To-day I wanted to examine a dead tooth and I did not think it needed any suggestion, but she stopped me and said, "No, the terror makes it simply impossible for me to bear it." I suggested the removal of the terror, and there was not a quiver from her afterwards.

Dr. Williams.—Dr. Fillebrown's remark that if you tell patients that you will not hurt them, you really do not, reminds me of a story I came across the other day of a boy whose mother had full faith in this sort of thing under another form. The boy had the toothache and his mother took him to a mindcurer, who went through some motions with his hands and said, "Your tooth does not ache now." The boy looked up at him and said, "You lie, it does." Now, sometimes it happens that they will not believe you when you tell them that you are not hurting them.

A good many years ago a friend of mine suggested that we go and take some lessons on this subject,—biology, as it was then called. We took a course, and I practised on several patients, and one day a gentleman asked me if I thought I could fill some teeth for his wife, a lady of very nervous temperament who could not bear to have anything done by the dentist. She came to my office and the experiment was entirely successful, as she underwent a very severe

operation without the slightest pain. I remember there was a large cavity in a lower first molar in which the pulp was exposed, and I cut into the pulp during this hypnotic state and took it out and cleared out the canals and dressed the roots. That I consider about as sharp a test as could be made with any anæsthetic. So there is something in it. I found, however, that it took up much time.

Dr. Fillebrown.—I don't believe that hypnotic suggestion or anything else will obtund in every case or often sufficiently to extract a pulp.

Dr. Williams.—My case was certainly one in which it sufficed.

Dr. Fillebrown.—There are limits to all things human, and I would not have any one think for a moment that anything that I use is with me absolutely successful in all cases, or more than seldom in very severe cases.

Dr. Stevens.—Dr. Fillebrown is certainly progressing, judging from his remarks to-night, and I think he will find as time goes on that he will not need to use the verbal suggestion; he can use mental suggestion with very good effect. Some people hold that a person cannot be hypnotized without giving consent. I have seen something of hypnotism for many years, and I know from practical experience that such is not the case.

I don't know whether any of the gentlemen present have used what is called "Thayer's Obtundent," either for sensitive dentine or for application to the gums. I have found it very nice, especially for application to the gums in applying ligatures. I applied it to open an abscess for my sister, and found afterwards that in this case the skin turned white and sloughed off. Dr. Draper used some of it, and it produced the same result. There is no complaint from the patients and no bad after-results; but the appearance is unsightly.

Dr. Williams.—I should say the moral of that was not to use anything the composition of which you do not know.

Dr. Fillebrown.—My own experience is not sufficient to settle the question whether it is possible to hypnotize without consent of patient; but the literature on the subject states that only in very exceptional subjects would it be possible to hypnotize without passive consent and utterly impossible with active resistance.

Dr. Williams.—From my observations, that would depend somewhat on how much a person had been accustomed to being hypnotized. Sunderland, the famous lecturer, used to go through the audience and fix his eyes on some one and mentally will that person to get up and go on the stage. In that way he picked out his most impressible subjects and amused the rest of the audience.

Dr. Andrews.—That matter recalls an incident which took place in my uncle's office years ago. This same Dr. Sunderland was present when a teamster came in to have several teeth extracted. He went up to the man, made a few passes, and told him to sit down in the chair, and several difficult teeth were then extracted without his knowing it. Dr. Sunderland slapped the man on the back, and, of course, he came out all right and went away feeling happy. That was done without the man's consent or knowledge that he was going to be hypnotized.

Dr. Stevens.—I have seen the same thing done.

THE regular monthly meeting of the American Academy of Dental Science was held in the Boston Medical Library Association rooms, May 3, 1893, at 7.30 P.M., President Brackett in the chair.

President Brackett.—We come to the subjects of discussion for the evening, which are as follows: 1. "What are the advantages and disadvantages of the use of the matrix? (*a*) With gold. (*b*) With plastics." 2. "Should examining boards have power to grant certificates of qualification to undergraduates?" I believe Dr. Ainsworth is particularly interested in the first subject, and we shall be grateful to him if he will open the discussion.

DISCUSSION.

Dr. Ainsworth.—To me the advantages in the use of the matrix in compound approximal fillings of bicuspids and molars is very great. To begin with, let me say that I am, as a rule, an uncompromising advocate of contour work. I am also firmly of the opinion that we cannot better preserve approximal surfaces than by using non-cohesive or soft gold at the cervical wall. To make such a filling entirely of soft gold, either with or without a matrix, seems to me impossible. By the use of the matrix I fill approximal cavities one-third or two-thirds full with soft gold, building out a proper contour, and then finish with cohesive gold. It seems to me that it would be impossible to work without a matrix and attain the same positive result. And then, if the matrix is properly formed and adjusted in place, the finishing of the filling becomes a simple matter. I have never been able to use the matrix to advantage with gold fillings in the front teeth.

Dr. Clapp.—I have here some specimens that I prepared for an altogether different purpose, but as many of them require the use of the matrix, I make no apology for bringing them.

An advantage of the matrix for gold fillings is this: it often saves cutting away tooth-substance in the process of shaping a cavity. For instance, in the case of an approximal cavity in a devitalized bicuspid. The cavity may be quite large, and at the cervical margin may be U-shaped. To start a filling with gold in such a cavity without a matrix is rather difficult. To facilitate this process the tooth is oftentimes cut squarely at the cervical portion, thereby reducing the tooth at its weakest point. These cavities can be filled with a matrix without this sacrifice of tooth-structure. Dr. Ainsworth has spoken of other advantages, such as the more

rapid introduction of the filling and the labor saved in the finishing process. I cannot conceive of a case where a properly-adjusted matrix could be a disadvantage.

Dr. G. T. Baker.—I have used the matrix with a great deal of satisfaction, and have made it of various materials, some of which I have brought for your inspection. Here is a sheet of copper silvered on one side; it was the first material I ever used, and was suggested by Dr. H. A. Baker eight or ten years ago. This one is thin steel; and here is a piece of German-silver, also very thin. I have never used aluminum, but have seen it somewhere suggested for this purpose. We have not yet been able to successfully solder aluminum, which stands to its disadvantage. The other materials spoken of are very easily manipulated and soldered. I believe in making a matrix for each individual case; it can be done in a very short time, and is more satisfactory than using those we buy ready made. Here is a strip of brass which I use to a certain extent, which gives me a great deal of satisfaction.

Dr. Allen.—I wish to bear testimony to the great value of the matrix in my work. I use it principally in plastic fillings of all kinds. I have had some unfavorable results from its use in filling cavities with gold, but I attribute the want of success more to my lack of familiarity with the method than to the method itself. In using the matrix with gold fillings I have sometimes found them a little soft at the periphery, as I have been unable to thoroughly condense the gold around the outer edge of the cavity at the beginning of the operation. To avoid this I first lay the foundation of the filling, covering the edges of the enamel before applying the matrix, after which I adjust it, and complete the operation.

Dr. Ainsworth.—I would like to ask Dr. Allen whether he commences his filling with cohesive or soft gold. I refer to compound fillings in bicuspids or molars.

Dr. Allen.—Soft gold.

Dr. Ainsworth.—Do you have difficulty in condensing it at the cervical wall?

Dr. Allen.—Not more than at any other point.

Dr. Ainsworth.—The very places where you speak of failure I feel very positive of. May I ask what you use for a matrix?

Dr. Allen.—The steel plate.

Dr. Ainsworth.—And conform it to the original contour of the tooth?

Dr. Allen.—As nearly as possible.

Dr. Ainsworth.—What is your method of holding it?

Dr. Allen.—I hold it by means of ligatures or by a wedge.

Dr. Ainsworth.—May it not be that you hold it too positively at the walls?

Dr. Allen.—Possibly.

Dr. Ainsworth.—I am using a very thin cold-rolled steel, a steel that has a temper very similar to piano-wire. You can bend it to any desired position, and yet it has something of a springy nature. I form it as nearly as possible to the original contour of the tooth, and hold it in position by various methods. I often use the Perry separator, and then insert a piece of orange-wood at the cervical wall, not too tightly, but just tight enough to bring the matrix towards the tooth. Beginning with soft gold, I can force the matrix away, not only at the cervical wall, but all the way up, so that when it is taken off I have a cavity which is uniformly too full. Two-thirds of the surface is made of cohesive gold. With proper burnishers I can burnish the filling very nearly to a finish, leaving only a trifle to be done by the disks and strips.

Dr. Allen.—I thank Dr. Ainsworth for his suggestions, and would like to ask him if he shapes the edge of the cavity in any peculiar manner?

Dr. Ainsworth.—I shape the cavity with reference to filling it with a matrix, not having it too rounding, but very nearly on a plane, with just the feather-edge taken off. I then pack two-thirds or three-quarters of the filling with hand-pressure, beginning with my cohesive foil when I have yet sufficient undercut to hold the filling. I do not know how extensively the matrix is used, but I feel that it is not adopted as it would be if all understood its advantages. I was for a time prejudiced against it, feeling that it would be impossible to pack gold properly in the places of which Dr. Allen speaks. And I thought that the finishing would consist more in working the tooth down to the filling than in working the filling down to the tooth, but this has not proved to be the case.

Another advantage in the matrix is that it enables us to restore the original shape of the tooth without previous separation. In the case of teeth which have never been filled or filed away, I do not care for separation obtained by the wearing of a wedge for two or three days or a week.

Dr. Allen.—My method of managing cavities where the matrix seems to be indicated is to use the adjoining tooth as a matrix.

Dr. Ainsworth.—You get a point by that means, but you do not get a uniform fulness. Your leverage is from only one spot. I

venture to say that I can save one-fourth to one-third the time in filling an approximal cavity by using the matrix.

Dr. Meriam.—I think I am on record all I need to be as regards the materials to be used for matrices. I would speak again of the value of the optician's pliers, which give just the right curve for bending a matrix into position. Opticians use them for adjusting the spring of an eye-glass. They are not made in this country, but are imported by the American Optical Company.

One of the great values of matrices is in Dr. Clapp's method of confining a softer material so that it can be built on advantageously with a hard one. It thus helps out in those places where it would otherwise be difficult to retain a hard filling. I use it for this purpose quite extensively.

It is useful in molars in filling with amalgam when the cavity involves the mesial and distal surfaces. A matrix can encircle the whole tooth and be left on until the amalgam hardens.

There is an advantage in breaking up your amalgam chips and either mixing them with the fresh amalgam or embedding them in it. I think there is less contraction in an amalgam filling which is built into a hole. We speak of simple crown cavities as the simplest form of filling, and the question is suggested, "Do we not make a better filling when the filling-material is held on all sides against our pressure than when it is open on one side?" If we do, then it seems to me the matrix has a great value on that account alone. That idea is one which I do not think is on record. We know that of late years various drugs used in the form of pills or tablets which were formerly compounded by the assistance of the various gums are now made to hold together by a powerful pressure. In that way you get a condensed substance. Just in proportion as a substance is porous, just in that proportion will it be acted on chemically. A phosphate filling made with a matrix is a harder filling, and, consequently, less liable to solution than one made without such pressure.

I generally hold my matrix in place with a steel wedge, of which I have had several made. They are wedge-pointed, and just fit into my automatic plugger. After driving them in, a slight turn leaves them in position. I also use the ordinary pine wedge, which has, to a certain extent, the advantage which Dr. Ainsworth speaks of in the orange-woods,—that is, it is not too rigid. I whittle the pine out to a proper size and then compress it with a pair of pliers. After putting in the wedge a drop of water causes it to swell and hold the matrix firmly in place, though not so firmly that it will

not give a little. I have some of this soft pine with me, which I bought for horticultural purposes, and shall be pleased if the gentlemen will take as much as they wish of it.

Dr. Brown.—Ever since I have been in practice I have used the matrix wherever I could, thanks to Dr. Ainsworth's instructions. I find it helps me very much indeed, and I am sure I have accomplished results which I could not have without it.

Dr. Clapp.—I find it absolutely impossible to get along without the matrix in combination fillings of amalgam and gold. One of the great advantages of the matrix is the help it gives in making contour fillings. I have felt conscience-stricken repeatedly on account of the time used in filling when I have heard men who are called rapid operators give their experience. I had a short time ago a young man whose teeth had been cut down unmercifully, so that the spaces between most of them were V-shaped. At the cervical portion the teeth were close together, and I think in every instance where they had been filled decay had reappeared under the fillings. After I had worked some time on this young man, he told me, without any request on my part, who had had charge of his teeth, and I am sorry to say that the gentleman who did the work I consider to be the very best rapid operator there is in New England. Now, I have to contour those teeth in order to get them in any decent condition. The gums are very much inflamed from the impacting of food in the wedge-shape spaces. If it was not for the use of the matrix my work would certainly be very much more uncomfortable for the patient than it now is.

In teeth badly broken down by caries, the matrix is of great advantage. This specimen is a good representative. It is decayed down to the alveolar margin, not only on the distal surface, but a little on each side,—that is, both towards the palatal and labial surfaces. In such cases I adjust the matrix first and then put the rubber dam over it.

President Brackett.—I think we should express our sense of appreciation for this group of practical specimens that Dr. Clapp has been so kind as to put before us.

Dr. Meriam.—Having a distal cavity in a second molar, with the wisdom-tooth partly erupted, I made a matrix with an upper lip, which was bent backward, and formed a support for the rubber dam, which, without such help, could not be adjusted. This form of matrix changed a difficult operation into an easy one. You do not know how much cold-rolled steel can be forged without drawing the temper until you have tried it. You will find that you

can make a knuckle by making a dent in the steel at the point desired.

Dr. Stevens.—There is one class of cavities that has not been mentioned in connection with the use of the matrix, and that is those shallow approximal cavities where the teeth are sometimes so sensitive that we cannot get undercuts to retain the filling. In such cases I oftentimes apply the matrix and fill in against it with amalgam, and then put soft cement between the amalgam and the wall of the cavity to insert the amalgam, and then finish with either gold or amalgam. In that way I get a filling that will stay without undercuts, and the work is very easily done.

Dr. Baker.—I sometimes make a matrix from a Parmly Brown polishing strip. The strip is bent about the tooth with pliers, and the ends soldered with soft solder. I used to solder with eighteen-carat gold solder, but the soft solder is just as good, besides being inexpensive.

Dr. Stevens.—I do not understand how you can solder a matrix and then get it over the contour of a molar tooth.

Dr. Meriam.—In the case I referred to the molar tooth was so badly decayed there was not much contour.

Dr. Ainsworth.—I have had several cases lately of bicuspids that were very badly decayed, both upon the mesial and distal surfaces, so much so, in fact, that it was impossible to get sufficient retention to hold any filling excepting a cement. The pulps were alive, and enough of the bucçal portion of the tooth remained to make a good appearance. In these cases I used a matrix made by passing a piece of German-silver entirely around the tooth, drawing it together with the pliers, removing, and soft soldering. With a burnisher I arranged the contour on either side, having previously separated the teeth. By this means I have been able to fill a large part of the cavities on either side with soft foil. By building the top of the filling with cohesive gold, the distal filling held the mesial, and *vice versa*. And the result was a finely-shaped tooth, and one of great durability. This could not have been done without the aid of the matrix.

President Brackett.—Unless some one wishes to speak further on the subject we will consider the discussion closed on this matter and proceed to the second topic, which is, "Should examining boards have power to grant certificates of qualification to undergraduates?"

Dr. Stevens.—No.

Dr. Meriam.—I should like to ask if that applies to examining

boards generally, or to examining boards in Massachusetts? It is no use for us to express our wishes in matters over which we are not likely to get any control. The same power which gives the colleges the right to grant degrees or to establish qualifications for graduation also appoints the examining boards. Now, the question is, how far our examining boards have a right to refuse to examine any man who chooses to present himself. We must not hold the idea that an examining board created by Massachusetts could refuse to examine any person, or, having examined a person, could refuse to issue a certificate if the examinations were satisfactorily passed, whether the person be an undergraduate or a graduate.

Dr. Stevens.—I would say, in reply to Dr. Meriam, that the topic reads, "*Should* examining boards have the power to grant certificates?" It does not say, "*Have* examining boards the power?" That is another question. It seems to me that the time has passed when examining boards should have the power to issue certificates to undergraduates. We have men come up before college professors who do not creditably pass the examination, and they go before the dental board, and are allowed to practise.

Dr. Allen.—Dr. Stevens's remarks suggest a matter that came under my direct observation. About a year ago a student of one of our dental colleges, nineteen years of age, after having had a little less than nine months' actual experience in dentistry, went before the State Board of Examiners and applied for a license to practise dentistry. The result was that in the course of two or three weeks a letter came to him, addressed in my care, which read something like this: "Dear Doctor,—We have the pleasure of informing you that you have successfully passed the examination of the Massachusetts State Board of Registration in Dentistry, and that your certificate will be sent you in a few days." He received the certificate in due time, and with something less than ten months' experience came out a full-fledged dentist.

Dr. Meriam.—I do not see why the examination of the Board of Examiners should be so low. Some students pass who have not even matriculated.

Dr. Brown.—I graduated from the Boston Dental College in 1890, and the examination of the State Board was a very rigid one. Had I not taken the full course at the college I feel sure that I would not have been competent to pass. I do not understand how undergraduates are able to pass, though I know of a number who have done so. They must have been let off easily by the examiners.

Dr. Clapp.—I would like to ask Dr. Brown if, in his estimation, the examination which he received from our State Board was sufficient and satisfactory from a professional view.

Dr. Brown.—My examination was.

Dr. Clapp.—Do you think that the examination you passed would be sufficient to qualify any person to practise?

Dr. Brown.—It was certainly severe, both theoretically and practically.

Dr. Allen.—There must be a great many exceptions to the rigid examination which Dr. Brown passed. This young man that I speak of is an intelligent young man, but not remarkable as a student. He was not a graduate at the time of taking the State examination, and has not graduated yet; and it is doubtful if he will succeed in passing the dental school examinations this coming year. In the first year examinations he failed on anatomy, chemistry, and another study; he was conditioned on these three studies when he applied for examination at the State Board. His first filling was put in only six months or so before his State examination, and they passed him and gave him his certificate.

Dr. Payne.—I graduated in 1889, and took my State examination at the same time, and was only asked six simple questions.

THE regular monthly meeting of the American Academy of Dental Science was held in the Boston Medical Library Association Rooms, June 7, 1893, at 7.30 P.M., President Brackett in the chair.

The subject for discussion was "Orthondontia: Its present status. What are the simplest and most universally applied forms of apparatus, and most efficient retaining fixtures?"

President Brackett.—Dr. Smith has kindly consented to open the discussion.

DISCUSSION.

Dr. Smith.—I beg you not to get alarmed at this display of charts and models; they are here to help illustrate some points that I could not easily present without their aid.

In order to properly discuss the question propounded by our executive committee, it seems to me necessary to divide it into parts,—

1. Orthodontia: its present status.

2. What are the simplest and most universally applied forms of apparatus?

3. The most efficient retaining devices.

Let us first look a little into the history of orthodontia. In 1541, Egenolff published a book on "Medicine for the Teeth; how to keep them Good and Sound;" and in this book he mentions that form of irregularity produced by the growing of the permanent beside the temporary teeth. And he advises the extraction of the temporary tooth and instructs the patient to press with the finger the permanent tooth, and force it into place.

This, as far as can be ascertained, is the first mention of irregularities. Fox, in 1814, and Calalan, in 1826, wrote extensively on dentistry, but little on regulating devices; and from that time until fifteen or twenty years ago slow progress was made in this important part of our specialty. In 1879, Dr. Kingsley published his work on "Oral Deformities," a book of five hundred and twenty pages, some two hundred pages of which are devoted to the irregularities of the teeth. This was followed in 1888 by the publication of the first volume, to be followed by two more, of a "Treatise on the Irregularities of the Teeth and their Correction," by Dr. J. N. Farrar. This remarkable and thorough work established forever the importance of orthodontia, and tended to make of it a specialty of dentistry.

Dr. Guilford, in 1889, by request of the National Association of Dental Faculties, published his book on Orthodontia, and in this

present year has republished it with many valuable additions. This book was published as a text book for use in American dental colleges, and the fact that the author found it necessary to enlarge it, and republish it in so short a time, testifies to the rapid progress being made in the department.

In 1890, Dr. Eugene S. Talbot published his book on the irregularities of the teeth, and goes more deeply into the etiology of the question than any of his predecessors. This book is a valuable acquisition to the literature of orthodontia, and we are encouraged to expect more in the same direction from this able writer. These authors, together with Magill, Angell, Patrick, Bymer, Jackson, Shaw, and others, have given freely of their inventive genius to the construction and improvement of appliances.

Let us now consider what are the simplest and most universally applied forms of apparatus.

In answer to this part of the question, I can only say what *I* consider to be the simplest and with me the most universally applied forms of apparatus. And to better present my point I will refer to these models and charts. But before doing so I wish to call your attention to the fact that in bringing these models and these charts here to-night, I do not intend showing completed cases of irregularities; that is, I do not show the models before regulating, the appliance used, and the condition after correction. I have brought parts of different cases in order to show the appliance for producing a certain movement. And first, as to moving instanding teeth.

This illustration shows an upper lateral incisor striking inside the lower incisor teeth. There is an opinion held by many that in order to bring that tooth back into place it is necessary to break the occlusion; in other words, the appliance must be so constructed that no tooth can strike in front of the tooth to be moved. I never pay any attention to the occlusion in moving a tooth. If it were true that the teeth were constantly locked together, the occlusion would have to be considered. But the fact is that we never have our teeth together except when eating, and this fact shows how unimportant this consideration is. In the case before us, therefore, we pay no attention to the articulation of the teeth, but simply adjust to the lateral incisor the necessary appliance. This case was completed in seven days, without pain or inflammation. The appliance used in such cases generally consists of what I term a Magill band. This is a ferrule similar to the band which is used with the Richmond crown, fitted to the tooth and cemented to

place. To this Magill band, on the labial surface, is attached a post with a screw-thread cut around it. This post passes through a bar, which rests upon, in this case, a central incisor and a cuspid.

By the side of this post is what I term a leader. It is simply a straight piece of gold, going from the Magill band through the bar, by the side of the post, to prevent the bar from twisting as you turn the nut. On the end of the screw-post a nut is placed, and when this nut is turned up the teeth move apart and the incisor is brought forward to place. A wrench is given to the patient and the nut turned a little every day. With this appliance the pain is absolutely in the hands of the patient. It is not necessary to go into a physiological explanation of the change that takes place. I simply mention it as one method, and a positive one, of moving in-standing teeth into line.

In this second case, as the lateral was very much crowded, instead of making a ferrule, a gold plate was made to fit the labial surface of the tooth, and secured to it by a ligature wound around the tooth, commencing at its neck and carried to the cutting-edge. That case was also completed in seven days without any trouble; and when the tooth was in place, there was no need of a retaining fixture. This chart shows a lateral incisor which was twisted; it was turned a little as it was brought to place. The appliance used contained two posts and two screws. In other respects it was the same as the one first described.

Another model that I will show you is that of a second bicuspid placed inside the arch, the first bicuspid and molar being in contact. To look at that model and see the appliance, we would hardly believe that it brought the bicuspid into place without any extraction, but, nevertheless, it did. This was a case that was under the immediate control of Dr. Banfield, who used the appliance and can vouch for its results.

When outstanding teeth are to be moved to place, the occlusion need not be considered. A very simple arrangement for this purpose is the Jackson appliance, which is made of piano-wire. The wire impinges upon the tooth and forces it to place. Years ago piano-wire was mentioned by Dr. Coffin, whose name is associated with the Coffin plate. Dr. Jackson sometimes constructs the whole appliance of piano-wire, or uses it in connection with a rubber plate.

For spreading arches I will give you some of the simpler appliances. The easiest and simplest appliance is the Coffin plate. When once applied, it is sawed through the centre and the wire pulled apart, so that the spring acts upon the vulcanite and spreads

the arch. The difficulty I have had with the Coffin plate is that in short teeth it is almost impossible to make the plate stay up, and in such cases I use the Shaw plate. In nearly all contracted arches you most need to spread the teeth in the anterior part of the mouth. It is very rare, indeed, to find that the arch needs spreading at the molars. The Shaw plate spreads the arch anterior to the molars more than at the molars. Here is an illustration of it. This is a vulcanite plate; here are the wings which are carried apart, and here are the jack-screws supplying a positive force. Here is a combination Shaw plate for a case in which you do not care to move the molars, or at least but very little. In this is made what I term a "movable resistance:" the power is applied on the outstanding tooth. There are many cases where the moving back of projecting teeth involves an important question of resistance. The making of a resistance of any one of the back teeth is always attended with some risks, on account of the disposition of posterior teeth to move forward. As a result, when you have finished regulating, you may find an impaired occlusion. In my experience with such cases I have found that, after my regulating was completed and the æsthetic part was satisfactory, I had tipped a molar up or down or driven a tooth into the socket, so that the articulation was injured.

In this case, the model of which I now show you, I made a resistance of a skull-cap. I first fitted Magill bands to the molars and central incisors. On the buccal surfaces of the molars were attached two lugs, through which was a hole for the passage of a gold wire, which extended in front of the incisor bands and was kept from slipping by four projections attached to these bands. A bib or bar extended across the outside of the mouth and rested on the wire before mentioned. To the bib were attached four strong elastics, which extended to and found attachment on the skull-cap already described. This was worn during the night only, and the movement gained was held during the day by an elastic, extending from a slight enlargement on the wire to the lugs on the molars. The projecting incisors were carried back in a comparatively short time, and this was accomplished without pain and with but little discomfort.

Another process of moving teeth which is much in favor with me is this. I make a vulcanite plate covering the palatine arch, to which is attached piano-wire, which fits all the teeth excepting the one I wish to move. In this way the teeth are all tied together and make a resistance that is immovable. I then wedge the tooth which I wish to move, to the desired position.

Now, for torsion of teeth, this chart represents a medium case. Here I used piano-wire in connection with a band, as here illustrated. The spring of the piano-wire turns the tooth into place. In using piano-wire, care must be taken not to have it too large.

Where teeth do not erupt as readily as they should, there are many ways of assisting the process. The simplest, as shown in this illustration, is an appliance made to impinge upon the tooth which you wish to elongate.

Where there is a projection of the lower jaw, the only method to bring it back to place is to use the skull-cap with powerful elastics. There are different theories as to how the jaw is carried back. Some hold that the ramus is bent. But I think it is accomplished by the carrying back of the condyle into the glenoid cavity.

If you have moved an outstanding tooth to line and a retaining fixture is necessary, here is an appliance that can be used. A lateral incisor has been carried to place and is retained simply by a Magill band with two prongs attached to it, one on the inside and the other on the outside. Another retaining fixture which was worn for seven months was made by striking up caps to fit over several teeth and cementing them in place. The gold was somewhat unsightly, and it was afterwards made less cumbersome with the use of a little wire crib. In case you have spread an arch and want to hold it in place, it can be done by putting in a vulcanite plate covering the arch.

We sometimes have a deformity of the teeth caused by a deformity of the alveolus. In the case which I show you the jaw is farther down on one side than it is on the other; and I learned from the mother that the child's head was very much compressed and broken by the forceps at birth.

When one comes to study the many different appliances which are set before him for the regulation and retention of teeth, he is led to conclude with Hamilton that a man's genius is shown not so much in inventing new devices, as in choosing from the devices already invented.

President Brackett.—Gentlemen, you have all listened with much interest and profit to this discourse from one who knows practically of what he speaks. I have no doubt that Dr. Smith will be ready to make plainer anything that is not fully comprehended, and the whole subject as stated upon the card is before you for discussion.

Dr. Williams.—Dr. Smith in his discourse referred to what Dr. Jackson called the "crib." I may be able to throw a little light on

the history of it. About forty years ago I saw a case of that sort on a patient who had been in Paris and who brought it over with her. It was put on by Dr. Evans, and that gave me the idea of what I called the "basket" framework as a basis for various kinds of regulating, and I have used it extensively ever since. When Dr. Jackson called my attention to the idea and supposed he invented it,—and he probably did invent it, for it sometimes happens that a person will think of something that he does not know already exists,—I wrote to him reminding him of these things, so that he might know how far back the idea could be dated. A specimen of it was made by Dr. Merrill when he graduated at the Harvard Dental School in 1871, and placed in the museum, and is probably there now.

Dr. Smith.—Dr. Payne reminds me that I have given the impression that the Shaw plate for spreading must necessarily cover the teeth. It can be adjusted merely on the lingual side when necessary for the comfort of the patient. I make a great point of not hurting patients in regulating their teeth.

Dr. Williams.—I used the ferrule that you call the "Magill band" when I was quite a youngster with Dr. Keep. That was before the phosphates were invented, and I arranged it so as to tie it on and thus keep it in place.

Dr. Clapp.—I cannot let the opportunity pass without expressing my very high appreciation of the talk that we have had tonight. The subject has been put before us in such a clear and comprehensive manner that we must be very dull indeed if we can go home without receiving much benefit from it. So far as I have used the appliances spoken of, I can testify to their efficacy.

Dr. Banfield.—It may not be generally understood that in the adjustment of some of the plates described, the teeth need separating. Will Dr. Smith please explain?

Dr. Smith.—It is necessary to put in one ligature or wedge, so as to let this thin band of No. 30 gold pass. It requires but little separation, and I prefer to separate rather than file the teeth.

Dr. Batcheller.—Dr. Smith spoke of wedging teeth forward. May I ask what he uses for large wedges?

Dr. Smith.—In some cases I use a piece of cottonwood, in others hickory. These wedges are fitted nicely, and the pain is entirely under your control, just as it is with a screw. In moving a tooth it is our object to have that movement take place with the minimum amount of pain and inflammation. As long as the change is physiological it is a healthy one, but when it becomes pathological you

run the risk of a dead tooth. To-day with the modern appliances the teeth can be regulated with but little pain or discomfort to the patient.

Dr. Cook.—I am very much indebted to Dr. Smith for presenting this subject in the thorough manner in which he has. I could not help thinking, while he was speaking, that if I had received such plain instruction when at the dental school I would not have had so much difficulty in understanding this part of practice.

I use the rubber pin inserted in a conical hole for moving out a tooth. I drill the hole right through the plate with a square-pointed fissure-drill. The rubber is prepared by taking two thicknesses of rubber and putting them into a vulcanizer between two pieces of German silver. I file this vulcanite into proper shape, and insert it in the plate so that it will impinge the neck of the tooth and force it out.

For drawing the front teeth back I use a jacket-plate. A hole is made in it by vulcanizing a piece of piano-wire in its substance, then drawing the piano-wire out. A gold wire is inserted in its place and a rubber elastic attached to the gold wire; this elastic serves as the force for pulling the tooth into line.

Dr. Fillebrown.—Referring to the matter of history, I might speak of what Dr. Smith calls the "Magill band," which, by the way, is a good name for it. The first man I ever heard mention it was Dr. Shepard, who showed it before the New England Dental Society, about 1865, long before oxyphosphate was known.

I used a Farrar appliance in a case which was recalled by Dr. Smith's speaking of the disposition of posterior teeth to move forward. An inferior cuspid was quite out of line, and I wanted to move it back. To do this I removed the first bicuspid, and made a Farrar band that enveloped the two molars and the remaining bicuspid. The cuspid was clasped with a band regulated by a screw. Those three teeth were to be used as a resistance, and I gave my patient a wrench, with the necessary instructions. But, instead of the cuspid starting a bit, the three posterior teeth came forward into the space left by the bicuspid.

I use the screw oftentimes for moving instanding teeth outward. I don't know who invented it, but I have used it as far back as 1883. A jacket-plate is made and a small screw inserted behind the tooth to be moved. This is turned up about half a turn each day. I have moved a lateral incisor out with this appliance in about a week.

I have lately used the rubber pin set in a tapering hole in a rubber plate. It slips up against the tooth and moves it out very nicely.

I have always looked favorably upon piano-wire for moving the teeth in, though I have relied principally on the jacket-plate. In using a jacket plate one must be sure and have a perfect resistance; if you do not, the plate will be thrown out.

I was much pleased to learn the fact, which Dr. Smith has mentioned, that you can move an instanding tooth without making an opening for it. My feeling was that it would impinge so much as to make it impossible to get it into place; but I am happy to know that it does not, and will be pleased to try his method.

President Brackett.—Unless there are further remarks, it would seem appropriate to proceed to the next subject of discussion that has been put before us. The subject is, "What materials are best for temporary fillings to be retained for a minimum of three years?"

Dr. Stevens.—I would suggest that most of the permanent fillings that are put in do not last as long as that.

Dr. Fillebrown.—I should call a filling permanent if it lasted three years.

Dr. Williams.—I once put in some temporary fillings for obtunding purposes, intended to last for three months, and they remained twenty-eight years. I then took them out and filled with gold. The cavities were between the lower incisors; they were completely protected from wear, and no subsequent caries occurred.

Dr. Banfield.—I have recently seen Weston's cement fillings that I inserted in crowns of molars eight years ago. They are now in as good condition as when inserted.

Dr. Eames.—I think it would be well to have a general understanding as to what we mean by temporary fillings. Years ago I supposed that temporary fillings were associated with certain materials, such as gutta-percha, cement, etc.; but I now understand that a gold filling may remain in a cavity a much shorter time than gutta-percha. For instance, some time ago I saw a well-preserved red gutta-percha filling which had been in the mouth for seventeen years. It was on the lingual surface of a superior central and lay well up under the gum. The filling was flush with the edges of the cavity, and needed no repair. It seems to me that a temporary filling is one which is inserted for a limited time, with the intention that some other filling will take its place in the future.

Dr. Williams.—One great trouble I have found in using temporary fillings is that they are likely to be forgotten by the patient, and are supposed to be permanent, while the original intention was to prepare the cavity for a permanent filling. I often call such fillings a dressing, and tell patients "I am putting this on as I would a bandage on a wounded finger. It is not intended to remain; you must come and have a more durable put in." I do not call this a filling, but a treatment.

President Brackett.—We come to "Incidents of Practice and Presentation of Specimens."

Dr. Allen.—I have a couple of models here which may interest the members,—two cases of hyperostosis, one of the lower jaw, and the other of the hard palate. The teeth in each case are in a perfectly healthy condition.

President Brackett.—Probably there is little tendency of the teeth to decay.

Dr. Allen.—Very little. The lower case has been progressing for twenty-five years, and there has been a slight increase in the size of the tumor during the last five years. The size of the tumor in the other case has not changed perceptibly during the past six years, in which I have had frequent opportunities for observing it.

Dr. Williams.—I saw a case of that sort on the upper right jaw which grew so large that it impeded the gentleman's speech. It was cut out and never returned. I also had another case on the lower right jaw, and in this case the protuberance was a small one. It had existed for three or four years, and occasionally there was inflammation. I made an incision and scraped off a little piece of exfoliated bone, and then it healed up.

Dr. Clapp.—Some two or three years ago one of my patients came into the office considerably excited, and said that her husband was very much depressed and alarmed on account of having discovered a hard tumor in his mouth. She said that his physician had seen it, and rather increased the alarm. I examined the case and found a growth not more than one-half or two-thirds as large as the one Dr. Allen has shown, and I told the gentleman that he had probably carried it there for twenty years and had just discovered it. He now takes no notice of it, and it has not increased in size since that time.

There is a case which I wish to speak about which is fresh in my mind, as the patient was in my chair to-day. It is a boy thirteen or fourteen years of age, who is very healthy, and has been in at least average health all his life; but his molars, bicuspids, and

incisors are simply riddled with cavities. You have all seen the same character of teeth; if there is the least defect in the enamel, on following that up you will find a large cavity beyond. This condition is in contrast with that found in the boy's brother, who is a year or two older and who has for years been very much out of health. His system has been upset some way or other, I don't know how, but his nutritive functions are all out of order, and he isn't able to go to school except a part of the time. He came to my office the other day and I examined his teeth and found them in very good condition, and during the past six or eight years I have put in on an average not more than one or two fillings a year, while his brother has teeth which look as though they had a charge of fine shot put into them.

Dr. Banfield.—I have a patient, a boy of sixteen years, whose teeth are riddled with cavities in the manner of which Dr. Clapp speaks. He has an older brother whose health is not as good, but whose teeth are in a much better condition, perhaps up to the average. I would like to ask Dr. Clapp if in his case he advised filling these teeth with gutta-percha or cement, or if he would discourage the boy in trying to save his teeth?

Dr. Clapp.—I have used nothing but cement fillings. They last very well, but an enormous number of new points of decay seem to develop at every examination. Of course I occasionally have to refill the cavities that I have filled with cement. I certainly try to encourage the boy and not discourage him.

Dr. Smith.—Have you tested the secretions in the mouth?

Dr. Clapp.—No, I have not. It seems to me that the cause was the improper nutrition of the teeth during their formation. The decay is very marked, as though the fissures were not properly calcified when the teeth were growing.

President Brackett.—The chair would ask Dr. Clapp if he has knowledge of the dietary habits of the child,—whether it is suitably fed at suitable intervals, and is not kept constantly supplied with confectionery by an injudicious relative.

Dr. Clapp.—I have not made any inquiries. The family consists of four children, and the mother is very careful and a woman of good common sense; but so far as my experience goes in trying to get at the dietary habits of children, it is simply a farce. They will tell you almost anything.

Dr. Banfield.—Dr. Clapp says that he has used cement. I would like to ask if he thinks that wears as well as gutta-percha?

Dr. Clapp.—I have no fault to find with it in this case.

Dr. Banfield.—With the patient that I have I first tried cement, but as it dissolved badly at the cervical walls, I have put in gutta-percha for the last few years, using in most places Owens's. I find that it does better in his mouth than cement. Even gutta-percha after awhile disintegrates and needs replacing. There is not a sound tooth in the boy's mouth, and if it were not that he was faithful he would long ago have had a number of exposed pulps.

Dr. Allen.—Although it is out of the regular order, I move that we now listen to Dr. Fillebrown, who has a new method of administering ether.

Dr. Fillebrown.—The chief difficulty which we have had in etherizing patients is that we have frequently been obliged to stop work in order to re-etherize, and it takes longer to etherize than it does to do an ordinary operation. Last fall I became acquainted with Dr. Packard's method of etherizing, which consists in supplying an atmosphere with a definite amount of ether vapor in it. It occurred to me to extend this principle and make the apparatus on a large scale. I used a wash bottle, such as is made for purifying gas. You will see that there are two tubes passing through the cork of the bottle, which contains ether. Into the long tube I pass a column of air driven by the Fletcher bellows, and this stop-cock controls the amount of air which shall pass through the ether. The vapor issues from the shorter tube, which can be of any good length, and the whole is placed in such a position that it will be near the face of the patient and still far enough off so that it will not excite inflammation. Both hands are by this method free for work. Anæsthesia can be maintained as long as you please, so that you can excise a nerve or perform staphylorrhaphy. I first experimented with the apparatus on a student who liked the fun of being anæsthetized, and I maintained the condition as long as I pleased. Twice since that I have done quite extended surgical operations in the mouth, and maintained the anæsthesia successfully. In the latter cases I induced anæsthesia by the older methods, and then maintained it with this method. In one case I found the anæsthesia so deep that I was obliged to reduce the strength of the vapor to prevent too profound effects. I believe this to be a great advance in the matter of anæsthetizing patients for operations in the mouth. The objection might be raised that the operator himself would be affected by the ether which permeates the air. I can only say I have experienced no difficulty in that direction.

THE regular monthly meeting of the American Academy of Dental Science was held in the Boston Medical Library Association Rooms, October 4, 1893.

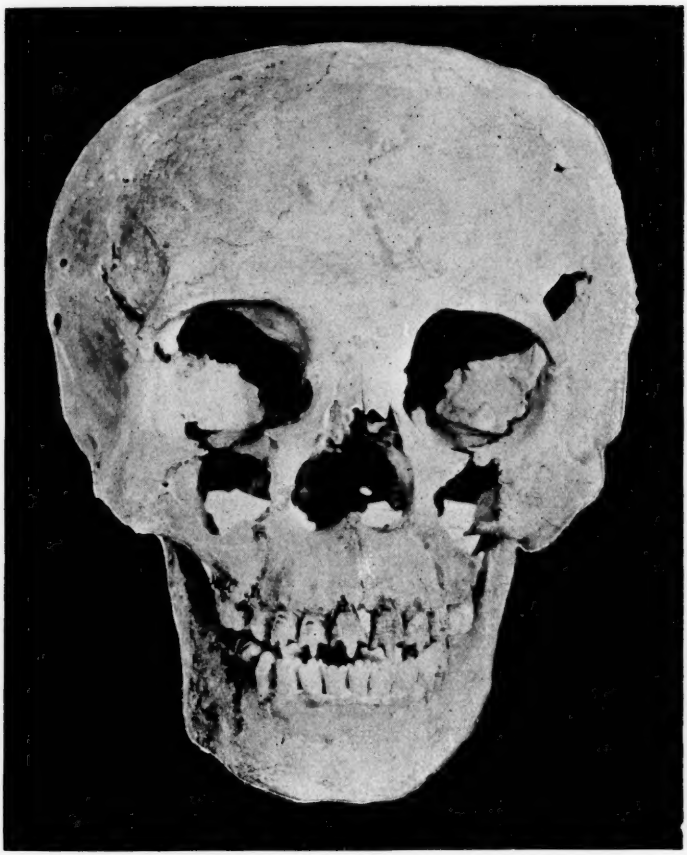
A paper by Dr. R. R. Andrews, entitled "Prehistoric Crania from Central America," was read.

PREHISTORIC CRANIA FROM CENTRAL AMERICA.

BY R. R. ANDREWS, A.M., D.D.S., CAMBRIDGE, MASS.

At the Peabody Museum, at Cambridge, there is a collection of archæological treasures, recently found in Central America, that have especial interest to the dental profession. These, consisting of crania, parts of the skeleton, a collection of teeth curiously filed and inlaid, with a fine collection of pottery and instruments which were made from bone, stone, and from a volcanic glass, obsidian, together with carvings and statues, are soon to be on public exhibition. They are being arranged in cases and around the room, while large numbers of photographs, showing the site of the excavations, are arranged within the cabinets upon the walls.

In 1890 the expedition that obtained them was sent to Central America by Harvard University under the charge of Mr. John G. Owens, a young archæologist of great promise, who died at his post of duty after the explorations were about complete. The expense of this expedition was defrayed by certain wealthy Bostonians. Most of these archæological treasures were brought from Copan, Honduras, and certain other ruins found in Yucatan. Mr. C. P. Bowditch, of Boston, who has been very much interested in the expedition, has now the charge of the collection. Mr. M. H. Saville, to whom I am much indebted, and who was with the expe dition, states that the site where these things were found was covered by a growth of old trees, and it was necessary for the natives to cut these away before the excavations commenced. An ancient temple of some kind was long supposed to have existed here, from the fact that carved blocks of stone had been from time to time dug up in the locality, and the excavations proved this supposition to be a fact. A large temple was unearthed, together with a number of the homes of the former inhabitants, and graves were found under the floors of the rooms of the houses These graves were either stoned in or cemented, after the bodies had been partly covered with loose earth. Other graves were found in deep cemented

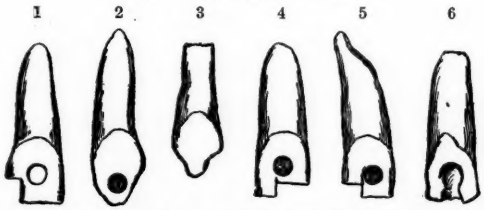


Filed teeth of skull over one thousand years old. Photographed by R. R. Andrews from Central American Exhibit, Peabody Museum, Cambridge. (Skull, grave 14, Labna, Yucatan. Found by M. H. Saville.)

chambers under the level of the ground, these chambers having the triangular arch commonly found in the buildings of this prehistoric people. The teeth on exhibition were obtained at Copan, Honduras. The skull, which is here shown, was taken from a grave at Labna, Yucatan, and is probably of a later date than the skeletons found at Copan, although it is undoubtedly prehistoric. It was found by Mr. M. H. Saville in grave No. 14, and in it may be seen how curiously were filed the six anterior upper and lower teeth. It is undoubtedly a Maya skull, of a person, probably a female, about twenty years of age, judging from the erupting wisdom-teeth. As no metal of any kind was found in any of the excavations, the teeth were probably ground down with coarse stone instruments. There is no decay in any of the teeth, all being

Skeleton 7, Mound 36. Filed without inlay.

GROUP I.
(From Copan, Honduras.)



1, central incisor, inlay lost, filed; 2, cuspid, beautiful green jade inlay near cutting-edge; 3, bicuspid, root absorbed, probably by abscess; 4, central incisor, green jade inlay and filed; 5, central incisor, green jade inlay and filed; 6, cuspid, inlay lost, broken through to cutting-edge.

sound; but the left superior cuspid is just erupting about a quarter of an inch inside the arch. It would seem as though these early people were flesh-eaters, and perhaps cannibals, and that the teeth may have been filed in this manner for the purpose of better tearing of flesh. The photograph would imply that the skull was of considerable capacity, but it recedes very perceptibly from the orbits upward, so as to appear as though much flattened. The teeth that were found at Copan, near by, are perhaps more interesting than the skull. Many of these have small circular pieces of green jade inlaid in a cavity that has been drilled by a stone or glass instrument in the face of the incisors and cuspids. These inlays are a little more than an eighth of an inch in diameter, the outer surface is rounded and brightly polished, and as perfectly fitted as it could be by the most skilled operator of to-day, with all the modern in-

struments at his command. In a few of the teeth the inlays have loosened so that it can be taken out, and there appears to be a white substance, perhaps a cement, between the inlay and the tooth, used to hold the inlay in place. It would seem that this inlay might be

GROUP II.
(Skeleton 8, Mound 36, Copan.)

Superior.—1, partially filled with a reddish cement (cuspid); 2, almost wholly filled with a reddish cement (incisor); 3, green jade inlay, no filing (incisor); 4, cuspid, same jaw, no filing and no inlay.

GROUP II.—*Continued.*

Inferior.—5, 6, cuspids decayed, no inlay, no filing; 7, stone tooth, carved from a dark stone; 8, decayed bicuspid and piece of socket.

some mark of distinction, perhaps used in the mouth of a chief or head man of the people. Some of these teeth are filed and have no inlay. Some are inlaid and not filed. And some are both filed and inlaid. Quite a number of the teeth are badly decayed. Much of this decay appears to be at the cervical border, and in no case does there appear to be any filling of any kind used to stop decay. None of them were filled for prophylactic purposes. In the teeth from skeleton 8, mound 36, found at Copan, two of the teeth that may have formerly had an inlay were partially filled with something that seemed like a red cement substance. None of these from this skeleton were filed, but in the lower jaw of the skeleton was found the most interesting curiosity in the whole collection to dentists,—a lower, left, lateral incisor that has been carved from some dark stone, and which has been implanted to take the place of one that had been lost. The tartar upon it would seem to show that it had been worn for some time during life. This implantation

antedates Dr. Younger's experiments by about fifteen hundred years. Many of the teeth were so completely covered with tartar as to form masses nearly double their original size, and in one case an upper molar had the tartar deposited in such a way, and to such a degree, that it formed a shape that articulated on the gum of the lower jaw where the teeth had previously been lost. In one case, at least, the drilling of the tooth to produce a cavity in which to fit the inlay, had encroached upon the pulp, and there is distinct evidence of recalcification of pulp tissue at this point.

The whole collection is one of much interest, perhaps the most interesting evidence of prehistoric dental work that is to be found in any museum, and it is well worth a visit to Cambridge to see.

THE regular monthly meeting of the American Academy of Dental Science was held in the Boston Medical Library Association Rooms, November 15, 1893.

An address was delivered by Reuen Thomas, D.D., Ph.D., of Brookline, Mass., entitled "The Advantages and Disadvantages of Specialism."

THE ADVANTAGES AND DISADVANTAGES OF SPECIALISM.

BY REUEN THOMAS, D.D. PH.D., BROOKLINE, MASS.

MR. PRESIDENT AND GENTLEMEN,—Ever since I accepted your invitation to be present at this meeting I have been in a state of constant wonderment at my own audacity. I have no kind of experience or ability which would qualify me to speak on dentistry. The moment I began to do that my position would be not dissimilar to that of the clown in the circus. If you have invited me here with the idea of aiding your digestion by increasing your laughter, I am afraid you will fail of your purpose, for I do not intend to speak on dentistry. So long as I do not commit myself to speech on that painful theme, I may get credit for knowing something about it. The probability that some of the learned gentlemen here present would not be able to follow me if I should venture upon the scientific treatment of the theme is one of the reasons why I forbear. When I tell you that my definition of a tooth would be about like this: "A tooth is a structure in which a process of the epiblastic layer—the buccal epithelium—grows into the subjacent dermis, and, assuming a cup-like form (with the concavity of the cup turned away from the epithelial surface of the mouth), a dermal papilla rises into the cup;" that the definition of a tooth would be something like that, and that the whole of the address would be consistent, both in language and lucidity, with this definition, I have no doubt of your congratulating yourselves that no such process stretches before your vision.

Modestly discarding all idea of mystifying this learned body by an essay on dentistry too scientific for general comprehension, I asked myself whether it might not be expected that I should speak, as one might say, anthropologically, and treat men as if they were teeth. Under that idea some men would be regarded as incisors, some as molars, some as sound, and some as decayed. Under these

headings we might possibly make a new and accurate division of the human race. These and other dental suggestions would lead us to such inferences as these: that there are some men we could do without and be all the happier; that as false teeth have sometimes a more pearly and regular appearance than true teeth, so also false men are sometimes even better looking outwardly than true men, and that Iago and Mephistopheles in all probability were most fascinating gentlemen. Along that line of remark we might find much that was interesting and profitable.

It seemed highly probable that you might want to know something of the relation of dentistry to theology. But the more I mused on that theme the more difficult it seemed to make the connection. That there is such a connection I have no manner of doubt. But the immediateness of the relation is not easy to discover. Jacob's ladder had its foot on the earth and its top seemingly in the heavens. Between the lowest and the highest round of that ladder there was a connection, and so, I suppose it is true that everything is connected with everything else. We know that teeth have a very important relation to food, and that food has a very close relation to digestion, and that digestion may become indigestion, and that under an attack of indigestion a clergyman might proclaim a very dark-hued and Satanic theology, and unpityingly and remorselessly send all his hearers into the Inferno so vividly imagined by Dante. So that there can be no doubt that dentistry has a relation to theology, and bad teeth may account for much bad theology, as also for the bad delivery of good theology. No one can question that there is a very manifest association between dentistry and speech. An indistinct and unintelligible utterance will spoil the effect of the most thoughtful speech, or the most intelligent sermon. The responsibility of dentists for much bad theology and poor preaching may therefore be greater than even the most thoughtful members of the profession have ever in their most serious moments assumed to be the case. If only it were possible to make a dentist's chair easy and attractive, so that it did not associate itself with pain, the most timid and nervous men and women would seek it as a matter of course, the men to be made useful and the women to be made beautiful forever. I do not mean to suggest that the speech of the woman part of mankind is not sufficiently distinct and emphatic as it is. But man is a speaking animal as well as an eating animal, and a skilful, scientific, humane dentist may be of as much service to all men whose profession involves public speech as is the first-class professor of elocution. For

the ability which a tooth has of punishing or serving its owner is among the things that are remarkable. A tooth can be as annoying as an Irish Bridget, as ingenious in inflicting pain as a Mediæval Inquisitor, or as serviceable to its master as Caleb Balderston in Scott's "Bride of Lammermoor."

But leaving all this preliminary skirmishing, confronted as I am with gentlemen who are specialists, I wish to offer a few thoughts on "Specialism: its advantages and its dangers." Dentistry has attained to the dignity of a profession. By and by a volume will be published, I do not doubt, entitled "Great Dentists," as now we have volumes on "Great Surgeons," "Great Lawyers," "Great Divines." But the time has not yet come for such a volume, as the profession is comparatively new. As a writer in the "Encyclopædia Britannica" puts it, "For long, dentistry was practised to a large extent as a superadded means of livelihood by persons engaged in some other pursuit, and without any professional education whatever. The blacksmith, the barber, the watchmaker, and others of the same class were the dentists of every village and country town; while even in some of our larger cities dentists of the kindwere till lately to be found practising under the very shadow of our universities and public schools." These words refer primarily to England, but they sufficiently well fit the past condition of things on this side of the ocean, if the speech of the men of seventy years and upward is to be taken as reliable. In our days it is not considered so respectable for a man to be a general practitioner as it is to be a specialist. The time has gone by when one and the same man taught classics and mathematics. The professor of Latin seldom ventures nowadays in any but a third-class academy or school to be also the professor of Greek. Every man has to be more or less of a specialist. The definition of a learned man or a scholarly man in our day has changed from what it was in the days of our grandfathers. Then a learned man was a man who professed to know all that was knowable of most everything. He was a walking encyclopædia, or, as was said of Macaulay, "a book in breeches." Now the encyclopædic man is generally regarded as a charlatan. A learned man in our day is a man who knows everything of something and something of everything. Some of his knowledge must be microscopic, but most of this knowledge telescopic. He is minutely acquainted with some one thing and generally acquainted with many things.

I assume that the gentlemen here present know everything that is to be known about teeth. And yet I doubt it. In order to know

everything that is knowable about teeth, is it not necessary that all and everything which is preliminary to the growth of a tooth should be known? It is certain that teeth are associated with the whole animal organism, and that the whole of the organism contributes to them, so much so that the reason why you and I have the teeth that characterize us is not satisfactorily accounted for by simply examining the teeth. At the back of the teeth is the blood in the veins, and at the back of that one knows not how many rogues and rascals in our ancestry until we get back (as one gentlemen I talked with the other day assured me he did) to William the Conqueror.

In order to give a full and particular account of anything belonging to any individual man, it is necessary to know vastly more than is revealed in the man's own individuality. A certain English nobleman, recently deceased, was what is called a kleptomaniac. He had everything that heart could wish, much more of wealth than any sane or insane man could legitimately use, and yet if he were left by himself for a while he would be like that politician who the first time he found himself in Washington, contrary to all his former propensities, had an overmastering desire to steal something. So this English nobleman, richer in money than Crœsus himself, had in his blood the persistent tendency to steal. How had it got there? Had it no relation to the fact that in days long ago his ancestors used to go on foraging expeditions and drive off the cattle of their weaker neighbors?

Now, if a learned man is a man who knows everything about some one thing, a learned dentist should be a dentist who knows everything that is knowable about teeth. But in order to do this he must know something about anatomy and physiology, and much else besides. For anatomy and physiology are associated with psychology and mental philosophy generally. The influence of mind on matter is only beginning to be appreciated. We are on the edge of a realm of knowledge which is as certainly hidden from us now, or revealed to us only suggestively—as much hidden as was the realm of the infinitely little before the invention of the microscope, or the realm of the infinitely great before the invention of the telescope.

Now, the tendency of specialism is to take the telescope out of a man's hand and leave him only with a microscope. The tendency is to imprison him within the limit of his specialism—to bring his mind under the power of the ideas and laws of that specialty which he is constantly studying. The mind of the specialist has a

tendency to conform to the thing about which it is persistently and continuously occupied, to take its tone, its color, its mode of vision, the way in which it looks at things from the particular region to which it bends its attention with most interest and with daily recurring constancy. The mathematician gradually loses all power of estimating the value of anything which cannot be mathematically proved. Unless by studies not mathematical he keeps his mind fresh and free, some of the most fascinating departments of knowledge will gradually lose their influence over him and he will be as mentally enslaved as the man who, looking at a most suggestive work of art full of life and expression, could make no remark but one. The size of the canvas led him to exclaim, "I wonder how many pounds of paint it took to produce that thing?" So, also, the biologist, the geologist, and other ologists, confining themselves to their specialty, gradually get their minds trained down to the conditions under which they are daily working, and come into an ability of appreciating only one kind of evidence. Illustrations of this abound. There was never a more convincing instance of the way in which the mind of a very eminent and distinguished man comes to settle into the mould of its specialty than when some years since Professor Tyndall asked of certain London divines that the question whether God answered prayer should be submitted to a practical test suggested by himself. The test was that the London Hospital should be divided into two sections. The church should offer up its prayer for the sick on behalf of the people in the wards on one side of the hospital, and not those on the other side. The result of the experiment should decide the question. Now, it is scarcely credible that such a suggestion, from the mind of such a man, could have been made seriously. Both God and all good praying people must have accepted as reasonable and intelligent Professor Tyndall's suggestion before it could have been made. To begin with, Tyndall's idea of prayer was not Christian. It was so ignorant an idea of what prayer is that a well-instructed Sunday-school child would see the defect in it. That Tyndall was serious there can be no doubt. The fact shows one of the dangers of our nineteenth century specialism, and how it reduces the minds of even superior men to the level of the particular branch of science in which they are constantly working, as the dyer's hand takes the color of the dye in which he puts it. That is why in that wonderful "Journal of Amiel," next to the thoughts of Pascal one of the most suggestive books of its kind ever issued, the writer says, "Science does not make men, but only entities and abstractions."

Scientific men are so given to analysis that many of them live in a dissecting-room for the period of their natural life. We may analyze a rose till we have no rose. We may dissect a human body till we have no body. Too much concentration tends to fix the mind on parts to the neglect of the whole. That every part suggests a whole, and needs a whole to explain it, is a fact of which we must never lose sight. That is what Tennyson is trying to say when he plucks the little flower out of the crannied wall:

> "Flower in the crannied wall,
> I pluck you out of the crannies;
> Hold you here, root and all in my hand,
> Little flower, but if I could understand
> What you are, root and all, and all in all,
> I should know what God and man is."

Specialism has, then, the advantage of giving a minute knowledge of some one part of the human organism, or of some confined region of science. The man who gives exclusive attention to the eye eventually arrives at a knowledge of all abnormal conditions to which that organ is liable, gets to discern every symptom and sign of disease, and to acquire all the scientific knowledge and skill which up to date belongs to his particular specialty. So with the ear, so with the throat, so with the brain,—a much more complicated specialty than the others I have named. So with every other organ and region of the body. And these specialists are the men to consult if you can afford to pay them their high fees, and if you are intent on commanding the best assistance which science can offer. Specialism is a distinct advance upon generalism. Not one word other than a word of gratitude to that Providence which is always moving the race onward towards something higher and better have we to offer in regard to it. Its helpfulness is often wonderful, its advantages are beyond question. So far as the general public is concerned, specialism is an immense gain.

But I am thinking of the effect of specialism on the specialists themselves. The question whether we are not in our generation growing a large crop of men who are learnedly narrow, and that because they are confined to too microscopic work, to research into detail rather than to research on the broad continents of knowledge, is a question which cannot be waved aside as if it were not worth the asking. There are laws of mind which are unalterable. The mind conforms itself to what it persistently studies. The laws of that branch of science control in its judgments. They determine

its modes and methods of thinking. Their tendency is to materialize the mind, and to compel it to think on all subjects mental and moral as if there were no other laws in the universe than material laws. So far as his thinking goes, a man is apt to see everything through the spectacles that have insensibly come over his eyes from the specialty with which he is persistently occupied.

As an illustration of what I mean, let us take the work of a modern man of eminence,—a man of whose goodness and greatness those who know him personally have no doubt. I mean Professor Henry Drummond, whose lectures at the Lowell Institute here in Boston commanded so much attention. The book which made him famous is entitled "Natural Law in the Spiritual World." "None," says Professor Drummond, "except those who have passed through it can appreciate the radical nature of the change wrought by science in the whole mental attitude of its disciples." And he goes on to teach with much wisdom and learning, and with that charming style of his which makes it so easy and so delightful to read him, how the thought of evolution permeates everything. He seems to be quite unconscious of assuming very much more than he can prove, in writing his book on the principle that "natural law," by which he means the law which is revealed in material nature and deduced from it, is identical with spiritual law,—the law of mind, and will, and imagination. His book is constructed on the assumption that natural law and spiritual law are identical. He assumes that the same laws which govern vegetable and animal life govern mind. I venture to say that he assumes it without proof. Indeed, we may say with much of positiveness that it is utterly impossible that the laws of the spiritual world, considered as a whole, can be identical with the laws of the natural world. The simple facts of free will and moral responsibility are themselves enough to create a radical difference between the two worlds. I know from personal communication with Professor Drummond, that if he had to issue his book now for the first time, that it would come from the press simply as an analogy and not as an argument,—simply as supplying illustrations which are wonderful and helpful. It is only fair to say that much. But it is an illustration of the fact, of which there can be little doubt, that the devotion of the mind to scientific pursuits is apt to engender a certain outlook on the universe, which, if not corrected by other considerations, may find it difficult to recognize the signs of the supernatural in nature and in history.

Now, if a man like Professor Drummond, who is a remarkably open-minded man, can fall into this error of assuming that material

law is the measure of all law, what are we to expect from men of a much lower type than he? Is there not ground enough and reason enough to say to all specialists, Beware of assuming that all the laws of the universe are to be interpreted by the laws you find working within the narrow area to which your study and observation are confined? Is there not a necessity to say to men who are specialists, Be sure you do not live and move and have your being within the limits of your specialism? Correct the tendency which your specialism creates to learned narrowness by taking excursions into all kindred departments of knowledge. It is marvellous how a man may all but destroy his ability of enjoyment in the region of his higher faculties—the poetical and historical faculties of his soul—by a servile attention to things that are minute and simply external. I was reading not long since, in a book by Dr. Birkbeck Hill, of Oxford, the following incident, which is by no means a bad illustration of what I mean. "A friend of mine in this University told me that before he had come up to Oxford he had read Virgil's 'Æneid' through with great delight. In preparing for the examination known as 'Moderations,' he was taken through it by his tutor once more, who treated Virgil not as a great poet, but as a convenient instrument of instruction in the niceties of grammar. Under the guidance of this teacher—

> 'One whose hand,
> Like the base Indian, threw a pearl away
> Richer than all his tribe'—

my friend gained his first class and lost forever his enjoyment of the Æneid.

"The man who would use a great poet for beating grammar into a boy, who would parse 'Hamlet' and analyze the 'Paradise Lost,' would not for one moment hesitate to botanize upon his mother's grave."

With all the advantages of specialism, and they are manifestly many, it is necessary to recognize that a man's specialism may so tyrannize over him as to drag him down out of the freedom and largeness of his manhood into being simply an oculist, or an aurist, or a dentist,—the laws of specialism so controlling the man that he views everything on earth, above the earth, and under the earth as a mere mechanic, and not as an artist. Even a man who is technically an artist and paints pictures may and often does become a mere materialist, a copyist of the externals of nature, with no imagination and no spiritual faculty whatever. The Greeks

themselves, when they had attained to the highest competency in sculpture ever reached in the history of the human race, seemed to lose all ability except the one ability which has immortalized them. They had studied the human body and the art of expressing it in marble until they lost all sense of modesty and decency, all ability of appreciating the moral and intellectual, so that a Pericles was a nuisance to them, and for Socrates there was nothing better than the cup whose content was death.

While, therefore, we pride ourselves on the wonderful advance we have made in dentistry, surgery, and other departments of knowledge and achievement during the last half-century, there is a necessity for reminding ourselves of the tendency of an age of specialists to produce men in large numbers who are illustrations of learned narrowness, men whose minds are warped, sectarianized, and materialized,—men whose world is a very much smaller world than it would have been if they had given serious heed to other studies than the bread-and-butter studies of life.

Moreover, it ought to correct our tendency to conceit and self-congratulation when we remember that with all our advance there are some things—yes, many things—which animals and even insects can do better than we can do. In their special line, bees and ants are capable of giving points to men. The business aptitude of ants is as great or greater than that of men. The science of government in the United States appears like the veriest tyroism when we go to the bees. Our rebuke of laziness and do-nothingism is feeble indeed compared with the practical indignation shown by bees to drones. "The more I know of dogs," says Madame de Staël, "the less I believe in men." We might add: the more I study insects, birds, and animals, the less I pride myself upon my mechanical superiority and my genius as a specialist. There is scarcely anything that man can do along the lines of these modern specialisms, however wonderful it seems, that cannot be eclipsed by something which some insect or bird or animal can do.

Man's superiority is in the connecting and associative faculties of his mind. His ability of connecting his knowledge with all other knowledge; his ability of large discourse, looking before and after,—yes, and we may add above and below. He connects this earth with that multitude of earths which we call the planetary and stellar systems, and thus realizes that he is not only a citizen of the world, but has an inheritance in a universe. Not only has he world faculties, but universe faculties. He has little use for them at present, but every germinal unused faculty has a promise

and prophecy in it. I think it was that very extraordinary man, the late Professor Sterling Maxwell, of Cambridge University, England, who suggested to us that in our nature there are latent faculties for which, in this present world, we have no use. Apart from their existence, it is, according to Professor Maxwell, very difficult to account for certain peculiarities in the higher faculties of men. This tendency of men to associate the known with that which the known suggests,—to associate the seen with the unseen,—a tendency found in all the highest natures, puts man in the scale of being far above every other creature occupying this earth. If this competency is distinctive of man, it indicates that his manhood consists not in anything in which he is like other creatures, but in that in which he is unlike them. Manliness is something quite distinct from animalness. It is only as we conquer and subordinate the animalness in ourselves that we develop the manliness.

We have often been reminded that there is such a thing as *professional pride.* I think such pride to be good and worthy. Do we not owe to the profession to which we belong such character and conduct as will add to its worth, respectability, and dignity? We hold the reputation of other men in our keeping, as well as our own. Every profession has in it men who are unworthy of it, men who regard it simply as a business by which to earn bread and butter. Doubtless there are such vulgar souls in your profession, as there are in mine. I say "vulgar souls," using the word "vulgar" in the way in which it is used by that artist in the use of language, John Ruskin. "Vulgarity," he writes, "consists in a deadness of the heart and body, gentlemanliness being another word for an intense humanity." Vulgarity shows itself in inability to feel or conceive noble character or emotion. This is its essentially pure and most fatal form.

There is no reason in itself why the profession to which gentlemen here present belong should not give time and opportunity and stimulus for nobler studies than those immediately suggested by a narrow view of its area. There is no reason why in it, as in surgery and medicine, there should not be developed a professional pride. But it is well for us all sometimes to face the great facts of life and interrogate them. Whatever our business in life be, it may be dignified or undignified. We may be artists or mere mechanics. As Gladstone says, "Our life may be food to us, or it may, if we will have it so, be poison." Every profession has its temptations, mine and yours. You know what yours are better than I can tell you. To cherish professional pride is helpful to

triumphing over these temptations. An organization like this, and everything else which lends dignity to the profession, is to be fostered as good. If it were to be assumed that your profession had already attained to the utmost of its excellency, such an assumption would only indicate how narrow were the limits within which your profession moves.

The time will come when a visit to the dentist will have no more terror in it than a visit to the physician, who simply feels your pulse and looks at your tongue and asks you the usual questions, and then gives a bottle of sugar-coated-pills. It is this perpetual striving after excellence on the one hand or the want of it on the other which, more than the original difference of gifts (certain and great as that difference may be), contributes to bring about the differences we observe in the works and characters of men. It becomes us never to forget that while professional and other men seem to be doing so many things, each and all are doing one thing,—the building of character. No man living can escape that. Every day and hour that is going on. That most popular of all professors in the Universities of Scotland, Professor John Stuart Blackie, of Edinburgh, may be a trifle dogmatic when he says, "The merely professional man is always a narrow man; worse than that, he is in a sense an artificial man, a creature of technicalities and specialties, removed equally from the broad truth of nature and from the healthy influence of human converse.

"But if a man will fix his mind on merely professional study, and can find no room for general culture in his soul, let him be told that no professional studies, however complete, can teach a man the whole of his profession; that the most exacting professional drill will omit to teach him the most interesting and most important part of his own business,—that part, namely, where the specialty of the profession comes into contact with the generality of human notions and human sympathies. Universal experience, accordingly, has proved that the general scholar, however apparently inferior at the first start, will, in the long run, beat the special man on his own favorite ground."

Such an opinion of such a man justifies, I think, my choice of a theme on which to offer the ideas I have been able to suggest,—the advantages and dangers of specialism. A young girl who had an offer of marriage she wished to accept submitted the matter to her father, who did not wish to have her vacate his home, and so advised her against matrimony, using as an argument the quotation from St. Paul, "Those who marry do well; but they who do not,

do better." "Well," said the damsel, "I love to do well; let those do better who can." In accepting your invitation, I thought that perhaps I was doing well; probably, by this time, some of you will be thinking that if I had declined, I should have done better. However, I may shield myself under the example of that apostle who, when the lame man at the beautiful gate of the temple asked an alms, replied, "Silver and gold have I none; but such as I have, give I thee." I hope that whenever I meet any of the gentlemen present, it may be under conditions when I shall have as little pain and as much pleasure as on this festive occasion.

THE regular monthly meeting of the American Academy of Dental Science was held at the Boston Medical Library Association Rooms, Wednesday evening, December 6, 1893, at 7.30 o'clock, President Smith in the chair.

The subject of discussion for the evening was "Orthodontia."

Dr. H. A. Baker.—Mr. President and Gentlemen,—Dr. Ainsworth and I do not claim to bring anything new before this meeting. We merely show a method by which regulating is made easy. We believe this method to be adapted to a greater variety of cases than any other of which we are familiar. It has to do with bands, a spread-plate, and retaining spurs.

The band is, in many ways, original with Dr. Ainsworth. He has already brought it before this society. I have of late adopted it in most cases.

The spread-plate differs from others in this respect, that the screw is made of German silver and the nuts are vulcanized into the rubber. With this appliance, you can push the teeth on one side more than on the other by properly slanting the screw; this can be done although the plate is split equally on both sides. Dr. Ainsworth, I think, claims the originality of this arrangement.

The spur I believe to be original with myself, and is adapted to the retention of a great many cases, after having been regulated. In many instances no other retainer need be used. It consists of a little spur or pin projecting from a cavity in one tooth, and resting on the adjacent tooth, thus holding the teeth in position. It is particularly useful in holding a tooth after being rotated, or in holding one or more teeth in line. Many cases have been retained by these spurs alone, without other appliances. I have here the models of a few cases, which I will show.

Nearly all these cases have been regulated by means of Dr. Ainsworth's band. This case has a right central turned a quarter way round, and a right cuspid placed outside of the arch. The irregular teeth are now in good line, and held in position by spurs. Here is another case, which is very much out of line, both as regards the upper and under teeth; the upper ones only have been regulated, and are now held in place by retaining spurs. Here is another case, in which the right cuspid is very much out of line, and the arch contracted. In this case I used the band in connection with the spur as a retainer. This case shows a separation of the front teeth. The under teeth seemed to throw the upper ones out, making a space of about one-sixteenth of an inch between the

incisors. This condition was corrected by the use of the band, which threw back the front teeth, both upper and lower. These teeth were retained in position by a wire hook passing around the upper centrals. I do not claim that they will remain in place. There is a cause for the separation of these teeth, and I do not know whether or not there is any remedy for it. I have here a bad case of protruding upper jaw, or a much receding lower one. This case is in my own family, and no one wishes it corrected more than I do. My plan of treatment is to put in place bands on both upper and lower teeth, and spread the arches by tying to the bands all the teeth in front of the molars. Then to take four square nuts, and solder a hook to each, and screw them on to the bands. Elastics are to be slipped over these hooks. The child is to wear the appliance constantly. You will see that the tendency of this arrangement will be to draw the upper jaw back and the lower one out, and so jump the bite. I don't know whether this apparatus will interfere with eating or not. I will try and explain on this model how teeth are retained by spurs. The right central and right lateral are both twisted. The right central was turned to place, and a spur put in the mesial surface of the right lateral, the spur holding the central in place. After twisting the right lateral to place, it was retained by drilling into the distal side of the right lateral, and putting in a spur which rested on the cuspid. Another spur in the mesial surface of the right central rested on the palatal surface of the left central.

Dr. Andrews.—Do I understand that these spurs are two little pieces of gold, connected with the band?

Dr. Baker.—No. The gold spurs project from the cavity in the tooth, about one-sixteenth of an inch, and rest on an adjacent tooth. They are made by cutting a strip from a piece of thick plate, and putting it in a port-polisher and working it down to the desired size. To insert the spur, I drill a cavity in the tooth, if there is not one there already, fill the cavity with cement, then insert the pin in cement. These pins will sometimes last a year or two, and there is no inconvenience from their use.

President Smith.—Do I understand that you have to drill a hole in a sound tooth in order to secure your spur?

Dr. Baker.—Usually a cavity already exists, but if there is none, I do not hesitate to drill one. These cavities can be readily filled again, in such a way that they will not decay. The only precaution to be used is to avoid drilling too near the pulp. I happened to discover these spurs in this way. I had a case some four-

teen years ago which required extensive regulating. After the regulating was completed, the question of a retaining appliance presented itself. My patient told me that he would not wear anything which showed. I replied that I did not see how it was possible for me to put anything in which would satisfactorily retain the teeth, and at the same time be out of sight. My patient still held to his point, and as a result of careful study, I thought of these spurs. Although I put in his mouth four or five spurs, in only one case was I obliged to drill into a sound tooth.

Dr. Andrews.—How long have you used these spurs?

Dr. Baker.—Twelve or fifteen years. I brought the matter before the Massachusetts Dental Society several years ago. I do not claim that this method is original, but I do not know of its having been used. To illustrate the difference between this method and that of retaining plates, I will mention the following case: A patient of mine, whose teeth had been successfully regulated, wore a retaining plate for about six months. I found that the enamel was decidedly affected in the case of the lower teeth, and I came very near having a bad result. I removed the plate in time to prevent serious harm, and became convinced that it was better to have the teeth in their natural condition, with as little as possible in the mouth in contact with them. To my mind, the drilling of a cavity in a sound tooth is far less objectionable than a retaining plate, because the point of contact is much smaller.

Dr. Ainsworth.—The apparatus used in the correction of the cases which I present to-night is the same which I brought before the Academy about a year ago, and as to the details of this apparatus, I believe I may claim some originality. It was in use by me two or three years before I brought it before this society. The apparatus is a modification of the Patrick band, from which I failed to get much satisfaction. After discarding this, I tried a band having its ends soldered to the anchor bands which were about the molars. But the heating of the band necessary to this operation removed its spring temper, a most important quality. In seeking a way to overcome this difficulty, I devised this method. The ends of the band were provided with a thread and nuts, and were allowed to pass through tubes about a quarter of an inch in length, which were soldered to the sides of the anchor bands, these bands being placed upon the molars. Here is a case where the upper front teeth protrude very much, the arch being contracted at the bicuspids. The lower teeth strike one space too far back. My first step was to spread the upper arch so as to make a fair occlusion when the

under teeth were closed one space further forward. After spreading the arch, I put the nuts at the rear ends of the tubes, and drew the front teeth in until the upper arch was in proper shape. I then instructed the patient to project the under jaw in closing the mouth, and relied upon her intelligence to accomplish the desired result. In this way the bite was successfully jumped. At first, especially at night, she found it difficult to keep her mouth closed in the new way. In the morning the occlusion would be more natural in the old way. She has entirely overcome that now. Had I used Dr. Baker's spurs on the laterals, they would have been held more positively, but the result is not unsatisfactory as it is. I use German silver for my band, but I know of no objection to using platinized gold. There is no one system of regulating which is invariably better than another. I believe the best system of regulating is that to which the operator is most accustomed. There is comparatively little trouble in moving teeth into proper position, but it is a great problem to hold them there. Here is a case of very prominent upper teeth, and it was very difficult to hold them in place after regulation, because the child did not appreciate what was being done for her.

Dr. Mead.—If a plate had been struck up and cemented over the tips of the front teeth, would not that have held them in position?

Dr. Ainsworth.—Such a plate would be effective, but also a great disfigurement.

Dr. Mead.—I have never had any trouble with this method. Once in a while the plate gets loose, and I replace it.

Dr. Ainsworth.—I think there is a great deal of value in the spur of which Dr. Baker speaks. In many cases a cavity already exists in which to insert the spur. I never hesitate, however, to drill one for this purpose. This seems to me a far less evil than to run the risk of damage from a less positive retaining appliance. Here is the material of which the band is made; it is all German silver. That for the anchor bands is wire rolled down very thin. Here are some seamless German silver tubes, made for me by the Spring Garden Metal Works of Philadelphia.

Here is a model showing a method which I pursue in the treatment of approximal decay in the molars of children. This case came to me with decay between the temporary molars. I cut a V-shaped opening between them, and thereby nearly obliterated the cavity. Seeing that trouble was coming between other temporary molars, I cut a V-shaped cavity between them all. I also caused the mesial surface of the sixth-year molar to be open to fric-

tion. This method has given me great satisfaction. In the chair, to-day, I examined the mouth of one of my own children, between whose temporary molars I had ground a V-space. I found that decay had been entirely stopped by the friction to which the teeth had been subjected.

Here is a case not in line with the subject of the evening, but of considerable interest to me. The upper front teeth were worn down nearly to the gum line. The pulps were alive, and so sensitive as to cause much trouble and inconvenience. I crowned all the teeth, using countersunk pin teeth set in firmly-fitting gold bands.

The work was finished a year and a half ago, and the teeth have done good service with nothing whatever to hold them but the band and the cement. One of them worked loose this summer, and I reset it; the others seemed as tight as though they were a part of the tooth itself. I have had occasion to set a number of such crowns upon teeth having live pulps, and always with a great deal of satisfaction.

Dr. Wilson.—In the case of Dr. Ainsworth's regulating appliance, I would like to ask, what is to prevent the anchor bands from getting up on to the gums.

Dr. Ainsworth.—That is a very important point. I wish to make it clear that the anchor bands are cemented on to the molars. They are of such thin metal that it is not necessary to file between the molars to get room to put them on. A wedge can be placed in both sides of the molar, and in two hours' time there will be room enough to pass this band through. Then I would use a very adhesive cement, and cement the band in place. They will occasionally come off, but not very often.

Dr. Mead.—Do you cement your bands and apply your wire at the same sitting?

Dr. Ainsworth.—Sometimes I would, and sometimes I would not. I consult my convenience and that of the patient. It is a good plan to cement the bands on one day, and put on the wire the next; in that way, you give the cement sufficient time to become thoroughly set. I do not take pains to make a perfectly fitting anchor band. I intend it shall be too large, so as to have a good body of cement to hold it.

Dr. Mead.—On leaving the house this afternoon, I took with me the models of what I call a "bull-dog mouth," and I brought also the appliance which I used in correcting it. I made a simple rubber plate to open the bite, so that the protruding under teeth could slide back within the uppers. By this plate also the lower teeth

were brought in by repeated ligations. The upper laterals were brought out by the "McQuillen band," with elastics attached, and it was done in a few days. The whole thing was completed in three months. The models are here before you, along with the appliances used.

Dr. Brackett.—One of the difficult teeth to retain in a changed position is a superior lateral which has been prominent, and whose mesial side has been rotated outward. If I rightly understood Dr. Ainsworth, he made the statement that the spur was especially applicable to the retention of these teeth, and that it might always be inserted on the palatal side.

Dr. Ainsworth.—That is one of the cases to which it is especially adapted. After the lateral is brought into place, the spur is fastened either into the lateral itself or a cuspid, either or both.

Dr. Wilson.—In such a case, you would put two spurs in?

Dr. Ainsworth.—I would use one or two, as the case seemed to require.

Dr. Mead.—In cases where the teeth have been drawn back very far, after getting them into position, I usually strike up a metal cap, about one-third the length of the teeth, and that holds them firm and fast.

Dr. Andrews.—I can speak well of the spur. I have used it for twelve or fifteen years. Dr. Cutler calls a case to my mind where I used it seven or eight years ago. My method was to drill a cavity in the tooth slightly smaller than the screw I was to use. I then dipped its end in sandarac varnish, and screwed it into place. You would be surprised to see some of these screws that were put in long ago; they have been allowed to remain, and no decay has taken place around them. I think the spurs were put in to hold back laterals which had been prominent—just such a case as Dr. Brackett speaks of. I drilled into the lateral, the gold screw was screwed into the hole, and the end rested against the cuspid. These spurs that Dr. Baker has shown seem to be in both teeth; I use them only in one tooth, and I always place them so that they are not in the way of articulation. I may have been indebted to Dr. Baker for the idea, for we have often exchanged views on such subjects.

However, I should be loath to drill into a sound tooth for the purpose of putting in a spur. It might not do any harm, but if we don't do it, we are certainly not running any risk.

To my mind, for a retaining apparatus to be used on the anterior teeth, there is nothing so valuable as a band, with little prongs

on either side. I recently saw a case which was under the care of a New York dentist, and there were six of these prongs, holding the regulated teeth in position, and holding them well.

Dr. Ainsworth.—There are a great many cases where the patient objects to anything that is conspicuous—anything that shows at all in the front of the mouth—and I think in such cases the spurs are a very great advantage. They can be worn for years, entirely concealed, and without any discomfort to the patient. I think in two-thirds of the cases where we want to use one we will find a cavity already existing. I should never hesitate to drill a cavity on the inside of a tooth, where it is out of sight, and can be perfectly cared for after we get through with the spur.

I make a point, when regulating, of carrying a tooth a little farther than I wish to have it remain, trusting that when the spur is removed, the tooth will naturally drop back a little.

I would say further, in regard to this regulating band and the ligatures, it is possible to produce a very great deal of suffering in tying up teeth or wedging teeth, and it is necessary to use a great deal of caution. There are a great many different ways in which a tooth can be tied up, and I venture to say that there are very few cases which cannot be tied in a positive way so that the ligature will not slide up under the gum, and produce unnecessary pain.

WILLIAM H. POTTER, D.M.D.,
Editor American Academy of Dental Science.

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